

!" #&/
4;O <548G=>3> 70AB>AC20==O ;V:0@AL:>3> 70A>1C

!® #
(ENZIX® DUO)

!::04:
4VNGV @5G>28=8: 5=0;0?@8;C <0;50B; V=40?0
1 B01;5B:0 1V;LH>3> @>7
4>?>28=8: ;0:B>78 <=>3V4@0B, <03=VN :0@1>=0B 206:89, 65;0B8=, :@>A?>2V4>=, <03=VN
AB50@0B;
1 B01;5B:0, 2:@8B0 ?;V2:>2>N >1>;>=:>N, <5=H>3> @>7
4>?>28=8: ;0:B>78 <=>3V4@0B, ?>2V4>= 30, :@>A?>2V4>=, <03=VN AB50@0B, =0B@VN
;aC@8;AC;LDB, B0;L.; >1>;>=:0 3V?@<5;>70, <0:@>3>; 6000, B0;L., B8B0=C 4V>:A84 (171).

V:0@AL:0 D>@<0. "01;5B:8. "01;5B:8, 2:@8BV ?;V2:>2>N >1>;>=:>N.
A=>2=V DV78:>-EVABV:
5=0;0?@8;C <0;50B: :@C3;V 42>>?C:;V B01;5B:8 1V;>3> :>;L>@C 7 @8A:>N 7 >4=>3> 1>;C;
V=40?0>?C:;V B01;5B:8, 2:@8BV ?;V2:>2>N >1>;>=:>N, 1V;>3> :>;L>@C.

\$0@<0:>B5@0?52B8G=0 3@C?0. <<1V=>20=V ?@5?0@0B8 V=3V1VB>@V2
0=3V>B5=78=?5@5B2>@N20;L=>3> D5@<5=BC (\$). =0;0?@8; V 4VC@5B8:8.
>4 "% !0902.

\$0@<0:>;>3VG=V 2;0AB82>ABV.

\$0@<0:>48=0
=78:A® C> :@518 2 >4=V9 C?0:>2FV: V=3V1VB>@ 0=3V>B5=78=?5@5B2>@N20;L=>3> D5@<5=BC
(A\$) 5=0;0?@8; V 4VC@5B8G=89 70AV1 V=40?0.
=0;0?@8;.
=0;0?@8;<0;50B O2;OT A>1>N 5=0;0?@8;>2C AV;L<0;5W=>2>W :8A;>B8, ?>EV4=C A?>;C:C 42>E 0
:8A;>B L-0;0=V=C V L-?@>;V=C. =3V>B5=78=-?5@5B2>@N20;L=89 D5@<5=B (\$) O2;OT A>1>N
?5?B848;-?5?B8407C, O:0 28ABC?0T :0B0;V70B>@< ?5@5B2>@5==O 0=3V>B5=78=C-2 @5G>28=C, I>
?V428ICT 0@B5@V0;L=89 B8A: 0=3V>B5=78=-. VA;O 2A<:BC20==O 5=0;0?@8; 707=0T 3V4@>;V7C 7
CB2>@5==O< 5=0;0?@8;0BC, O:89 A;C68BL V=3V1VB>@< \$. #?>2V;L=5==O \$?@872>48BL C
@57C;LB0BV 4> 7<5=H5==O :>=F5=B@0FVW 0=3V>B5=78=C-C ?;07 2545, C A2>N G5@3C, 4>
7=865==O 0:B82=>ABV @5=V=C C ?;07: CAC=5==O =530B82=>3> 72>@>B=>3> 7207:C 7 284V;5==O<
@5=V=C) B0 4> 7<5=H5==O A5:@5FVW 0;L4>AB5@>=C.
\$ T V45=B8G=8< :V=07V-. "0:8< G8=><, 5=0;0?@8; B0:>6 <>65 1;>;C20B8 7=865==O :>=F5=B@0FVW
1@048:V=V=C, A8;L=>3> ?5?B84=>3> 207>45?@5A>@0. 572060NG8 =0 F5, @>;L, O:C FO >1AB028=0
<>65 2V4V3@020B8 2 B5@0?52B8G=V9 4VW 5=0;0?@8;C, 70;8H0TBLAO 2V4:@8B>N 4;O 282G5==O.
A:V;L:8 <5E0=V7<><, 70 O:8< 5=0;0?@8; 7=86CT 0@B5@V0;L=89 B8A: :@>2V, 22060TBLAO ?5@28==O
AC?@5AVO A8AB5<8 @5=V=-0=3V>B5=78=-;L4>AB5@>=, B> 5=0;0?@8; 28O2;OTBLAO
0=B83V?5@B5=782=8< ?@5?0@0B< =02VBL C 28?04:C ;V:C20==O E2>@8E =0 0@B5@V0;L=C
3V?5@B5=7VN ?@8 =87L:>
@87=0G5==O 5=0;0?@8;C ?0FVT=B0< 7 0@B5@V0;L=>N 3V?5@B5=7VTN ?@872>48BL C
@57C;LB0BV 4> 7=865==O >1>E ?>:07=8:V2 0@B5@V0;L=>3> B8A:C V 2 ;560G>OG>;>65==V, ?@8G>
3> ?V428I5==O G0AB>B8 A5@F528E A:>@>G5=L.
!8<0B8G=0 ?>ABC?0;L=0 01> >@B>AB0B8G=0 3V?>B5=7VO B@0?;OTBLAO =5G0AB>. # 45O:8E
?0FVT=BV2 @>728B>: >?B8<0;L=>3> 7=865==O 0@B5@V0;L=>3> B8A:C <>65 ?>B@51C20B8 :V;L:>E
B86=V2 B5@0?VW. V7:5 V @0?B>25 ?@8?8=5==O 70AB>AC20==O 5=0;0?@8;C =5 1C;> ?>2O70=5 7V
H284:8< ?V428I5==O< B8A:C :@>2V.
D5:B82=89 V=3V1VB>@=89 2?;82 =0 0:B82=VABL \$ C 728G09=>

2-4 3>48=8 ?VA;O ?5@>@0;L=>3> ?@87=0G5==O V=482V4C0;L=>W 4>78 5=0;0?@8;C. @>O2
0=B83V?5@B5=782=>W 0:B82=>ABV 70728G09 <>6=0 ?>48=C, 0 <0:A8<0;L=5 7=865==O
0@B5@V0;L=>3> B8A:C :@>2V 4>AO30TBLAO G5@57 4-6 3>48=?VA;O ?@89>3> 5D5:BC 70;568BL
2V4 4>78. 572060NG8 =0 F5, O:I> 28E>48B8 7 C<>2 @5:><5=4>20=>3> 4>7C20==O ?@5?0@0BC, B>
9>3> 0=B83V?5@B5=782=0 B0 35<>48=0 28O2;5=>, 2 A5@54=L=>09<5=H5 24 3>48=8.
5:A?5@8<5=B0;L=8E 4>A;V465==OE 35<>48=0 =02VBL ?@8 2V4ACB=>ABV 1C4L-O:8E 7B8 A5@F528E
A:>@>G5=L. VA;O ?@89>AB5@V30;>AO ?>A8;5==O ?>B>:C :@>2V G5@57 =8@:8; H284:VABL 3;>
<5@C;O@=>W DV;LB@0FVW 70;8H0;0AL ?@8 FL>N. "CB =5 28O2;O;>AO 6>4=8E >7=0: CB@8 2>48.
572060NG8 =0 F5, C ?0FVT=V2, O:V 4> ?>G0B:C ;V:C20==O E0@0:B5@87C20;8AO =87L:8<8
H284:>ABO<8 3;>5@C;O@=>W DV;LB@0FVW, FV ?>:07=8:8 H284:>ABV 70728G09 7@>AB0;8.
?@>F5AV :>@>B>B5@28E ;;V=VG=8E 4>A;V465=L ?0FVT=V2 7 4V015B<< V 157 =L>3>, 0 B0:>6 V7
70E2>@N20==O<8 =8@>: ?VA;O ?@89>3;>1C;V=C IgG 7 A5G5N.
/:I> 5=0;0?@8; ?@89<0B8 >4=>G0A=> 7 A5G>3V==8<8 ?@5?0@0B0<8 B8?C BV0784V2, B> 9>3> 2?;82
=0 7=865==O B8A:C :@>2V 28O2;OTBLAO I>=09<5=H5 048B82=8
;8H5 >1<565=89 4>A2V4 70AB>AC20==O FL>3> ?@5?0@0BC C 28?04:0E ?54V0B@8G=8E ?0FVT=V2
7 0@B5@V0;L=>N 3V?5@B5=7VTN, B>1B> C 2VFV ?>=04 6 @>:V2.
=40?0
=40?01>N =5BV0784=89 AC;LD0;L=8< :V;LF5<, O:89 =0;568BL 4> AV<59AB20 4VC@5B8G=8E
?@5?0@0BV2. @8 4>1>2V9 4>7V 2,5 <3 V=40?0O2;OT B@820;C 0=B83V?5@B5=782=C 0:B82=VABL C
;N48=8. :A?5@8<5=B0;L=V 4>A;V465==O 70;56=> 2V4 4>78 ?@>45<>=AB@C20;8, I> ?@8 4>7V 2,5 <3
=0 4>1C 0=B83V?5@B5=782=89 5D5:B 28O2;OTBLAO <0:A8<0;L=8<, 0 A5G>3V==0 4VO 70;8H0TBLAO
C 4>;V=VG=8E <560E.
@8 FV9 0=B83V?5@B5=782=V9 4>7V 2,5 <3 =0 45=L V=40?0A;01;NT ?V428I5=C @50:FVN AC48= =0
=>@04@5=0;V= C ?0FVT=V2 7 ?V428I5=8< 0@B5@V0;L=8< B8A:>< V 7<5=HCT 7030;L=89
?5@8D5@V9=89 >?V@ B0 0@B5@V>;O@=89 >?V@.
@8G5B=VABL 5:AB@0@5=0;L=>3>, B>1B> ?>70=8@:>2>3><5E0=V7 0=B83V?5@B5=782=>3> 5D5:BC
?@>45<>=AB@>20=0 ?V4B@8<0==O< 9>3> 0=B83V?5@B5=782=>W 5D5:B82=>ABV C
3V?5@B5=782=8E ?0FVT=V2 7 DC=:FV>=0;L=>N 2V4ACB=VABN =8@>:.
!C48==89 <5E0=V7< 4VW V=40?0
" 7=865==O A:>@>GC20;L=>W 740B=>ABV 3;04:8E<O7V2 AC48= C=0A;V4>: <>48DV:0FVW V>==>3>
>1
" @>7H8@5==O AC48= C=0A;V4>: AB8AB03;0=48=C PGE2 B0 207>48;0B0B>@0 V 0=B803@530=B0
B@><1>F8BV2 ?@>AB0F8;;V=C PGI2;
" ?>A8;5==O 4VW 207>48;0B0B>@0 1@048:V=V=C.
C;> B0:>6 ?@>45<>=AB@>20=>, I> 2 @57C;LB0BV :>@>B>B5@2>W, A5@54=L>B5@2>W B0
4>23>B5@2>W 4VW C 28?04:C 3V?5@B5=782=8E ?0FVT=V2 V=40?0
" 7<5=HCT 3V?5@B@>DVN ;V2>3> H;C=>G:0 A5@FO;
" >G5284=>, =5 7
HDL-E>;5AB5@8=C;
" >G5284=> =5 ?@872>48BL 4> 778, =02VBL C ?0FVT=V2-4V015B8:V2 7 3V?5@B5=7VTN. >@
<0;V70FVO 0@B5@V0;L=>3> B8A:C B0 ?>0;L1C-:V;L:>ABV 1V;:0 C A5GV) A?>AB5@V30;8AO ?VA;O
?>4>265=>3> 70AB>AC20==O V=40?0AV1 7 0@B5@V0;L=>N 3V?5@B5=7VTN V 4V015B>
0@5HBV, >4=>G0A=5 ?@87=0G5==O V=40?0< 7 V=H8<8 0=B83V?5@B5=782=8<8 ;V:0@AL:8<8
?@5?0@0B0<8 (15B0-1;:>:0B>@8, 1;:>:0B>@8 :0;LFVT28E :0=0;V2, V=3V1VB>@8 0=3V>B5=78=-
-?5@5B2>@N20;L=>3> D5@<5=BC) 2545 C @57C;LB0BV 4> ?>;V?H5=>3> :>=B@>;N 3V?5@B5=7VW 7
?V428I5=8< 2V4A>B:>28< 2V4=>H5==O< @5A?>=45=V2 ?>@V2=O=> 7 B8<, I> A?>AB5@V30TBLAO
C 28?04:C B5@0?VW ;8H5 >4=8< ?@5?0@0B>
\$0@<0:>:V=5B8:0.
=0;0?@8;
IA>@1FVO.
VA;O ?5@>@0;L=>3> ?@89>2A<>:BCTBLAO, ?V:>2V 25;8G8=8 :>=F5=B@0FVW 5=0;0?@8;C C
A8@>20BFV :@>2V 7O2;ONBLAO ?@>BO3<< 1 3>48=8. !?8@0NG8AL =0 @57C;LB0B8 28O2;5==O
?@5?0@0BC 2 A5GV, <>6=0 A:070B8, I> ABC?V=L 2A<>:BC20==O 5=0;0?@8;C ?VA;O ?5@>@0;L=>3>
?@89>28BL ?@81;87=> 60 %. 5@>@0;L=89 ?@89< ?@5?0@0BC 5=0;0?@8; =5 707=0T 2?;82C 2V4
?@8ACB=>ABV W6V C H;C=>2>:-8H:>2>@0;L=>W 4>78 B01;5B:8 5=0;0?@8;C. D5:B82=0 B@820;VABL

?5@V>4C =0?V2282545==O ?@5?0@0BC 7 C@0EC20==O< 0:C:@0B=8E 4>7 B01;5B>: 5=0;0?@8;C
AB0=>28BL 11 3>48=. >AV1 7 =>@<0;L=>N DC=:FVTN =8@>: @V2=>206=V :=F5=B@0FVW
5=0;0?@8;0BC C A8@>20BFV :@>2V 1C;8 4>AO3=CBV G5@57 4 4=V ;V:C20==O.
>7?>4V;.

2AL>=V :=F5=B@0FV9, O:V E0@0:B5@87CNBLAO O: B5@0?52B8G=> 206;82V, 72O7C20==O
5=0;0?@8;0BC ?@>B5W=0<8 ?;07<8 ;N48=8 =5 <0T ?5@528IC20B8 ?>:07=8: 60 %.
V>;>3VG=0 B@0=AD>@<0FVO.

0 28=OB:>< :=25@AVW 7 CB2>@5==O< 5=0;0?@8;0BC, =5 A?>AB5@V30;>AO 6>4=8E ?>7=0:
<5B01>;V7

82545==O 7 >@30=V7

82545==O 5=0;0?@8;0BC 7 >@30=V7G0B:C @5=0;L=8< H;OE>;>2=8<8 A.;04>28<8 G0AB8=0<8 C A5GV
28O2;O;8AL 5=0;0?@8;0B, O:89 AB0=>282 ?@81;87=> 40 % 4>78, B0 =5?5@5B2>@5=89 5=0;0?@8;
(?@81;87=> 20 %).

8@:>20 =54>AB0B=VABL.

84V;5==O 5=0;0?@8;C B0 5=0;0?@8;0BC T ?V428I5=8< C ?0FVT=BV2 7 =8@:>2>N =54>AB0B=VABN. #
28?04:C ?0FVT=BV2 7V A;01:8< 01> A5@54=V< ABC?5=5< =8@:>2>W =54>AB0B=>ABV (;V@5=A
:@50B8=V=C 40-60 <:/E2) @V2=>206=0 :=F5=B@0FVO 5=0;0?@8;0BC (70 ?;>I5N ?V4 :@82>N) 1C;0
?@81;87=> C 2 @078 28I>N, =V6 C ?0FVT=BV2 7 =>@<0;L=>N DC=:FVTN =8@>: ?VA;O ?@89>
5 <3 ?@5?0@0BC 1 @07 =0 4>1C. # 28?04:C A5@9>7=8E ?>@CH5=L DC=:FVW =8@>: (;V@5=A
:@50B8=V=C =5 ?5@528ICT 30 <:/E2) ?;>I0 ?V4 :@82>N 71V;LHC20;0AL ?@81;87=> C 8 @07V2.
D5:B82=0 B@820;VABL ?5@V>4C =0?V2282545==O 5=0;0?@8;0BC ?VA;O ?@89>@07>28E 4>7 B01;5B>:
?>4>26C20;0AL =0 FL>2>W =54>AB0B=>ABV, 0 G0A 4>AO3=5==O @V2=>206=8E :=F5=B@0FV9
70BO3C202AO. =0;0?@8;0B <>65 2840;OB8AO 7 >@30=V7?><>3>N 7030;L=>3> 35<>4V0;V7C A8AB5<8
:@>2>>1V3C. ;V@5=A 4V0;V7C AB0=>28BL 62<:/E2.

VB8 B0 4>@>A;V.

\$0@<0:V=5B8G=V 4>A;V465==O 2?;82C 1030B>@07>2>W 4>78 ?@5?0@0BC 1C;8 ?@>2545=V 70
CG0ABN 40 ?54V0B@8G=8E ?0FVT=BV2 G>;>2VG>W B0 6V=>G>W AB0BV 7 3V?5@B5=7VTN C
2VfV 2V4

2 ≤ 16 @>:V2. >A;V465==O AB>AC20;8AO 287=0G5==O 2V4?>2V4=8E E0@0:B5@8AB8: ?VA;O
I>45==>3> ?5@>@0;L=>3> ?@89>AB5@V30;>AO 6>4=8E 7=0G=8E 2V4AB59 AUC) (?@82545=>N 4>
=>@<0;L=>3> ?>:07=8:0 25;8G8=8 4>78 =0 1 :3 <0A8 BV;0 =0 4>1C) =0@>AB0T 7 2V:×; =572060NG8 =0
F5, 7@>AB0==O ?;>IV AUC =5 A?>AB5@V30;>AL C B8E 28?04:0E, :=;8 40=V ?@82>48;8AL 4>
>48=8FV ?;>IV BV;0. # 28?04:C @V2=>206=8E :=F5=B@0FV9 A5@54=V9 ?>:07=8: 5D5:B82=>3>
?5@V>4C =0?V2282545==O 4;O 0:C282 14 3>48=.
=40?0

IA>@1FVO.

=40?0 V ?>2=VABN 2A<>:BCTBLAO C H;C=:>2>.:8H:>2>2V 4>AO30TBLAO G5@57 1-2 3>48=8 ?VA;O
70AB>AC20==O. !B04VO AB01V;L=>W :=F5=B@0FVW =0AB0T G5@57 7 4V1 @53C;O@=>3> ?@89>
>7?>4V;.

2O7C20==O 7 ?@>B5W=>< ?;07<8 ?>=04 79 %.

V>;>3VG=89 ?5@V>4 =0?V2282545==O AB0=>28BL 2V4 14 4> 24 3>48= (C A5@54=L>48=).

82545==O.

@5?0@0B <5B01>;V7CTBLAO 2 ?5GV=FV B0 282>48BLAO C 283;O4V =50:B82=8E <5B01>;VBV2,
?5@5206=> =8@:0<8 (70 % 4>78) V 7 :0;× (22 %).

0FVT=B8 7 ?V428I5=8< @878:>

\$0@<0:V=5B8G=V ?0@0<5B@8 =5 72>N =54>AB0B=VABN. @8 =0O2=>ABV ?5GV=:>2>W
=54>AB0B=>ABV 70AB>AC20==O BV0784=8E V BV0784?>4V1=8E 4VC@5B8:V2 <>65 A?@8G8=8B8
?5GV=:>2C 5=F5D0;>?0BVN.

;V=VG=V E0@0:B5@8AB8:8.

>:070==O.

@B5@V0;L=0 3V?5@B5=7VO.

@>B8?>:070==O.

=0;0?@8;.

V428I5=0 GCB;82VABL 4> 5=0;0?@8;C, 4> 1C4L-O:>W 4>?>W @5G>28=8 G8 4> 1C4L-O:>3> V=H>3> V=3V1VB>@C \$.

002=VABL 2 0=0<=57V 0=3V>=52@>B8G=>3> =01@O:C, ?>2 O70=>3> V7 70AB>AC20==O< V=3V1VB>@V2 \$.

!704:>289 01> V4V>?0B8G=89 0=3V>=52@>B8G=89 =01@O:.

5 A;V4 70AB>A>2C20B8 =78:A® C> 7 ?@5?0@0B0<8, I> 2).

03VB=V 6V=:8 01> 6V=:8, O:V ?;0=CNBL 70203VB=VB8 (482. «0AB>AC20==O C ?5@V>4 203VB=>ABV 01> 3>4C20==O 3@C44N»).

=40?0

V428I5=0 GCB;82VABL 4> V=40?0=0 4> 1C4L-O:8E 4>?>28=; BO6:0 =8@:>20 =54>AB0B=iABL; ?5GV=:>20 5=F5D0;>?0BVO 01> BO6:5 ?>@CH5==O DC=:FVW ?5Gi=:8; 3V?>:0;VT

70T<>4VO 7 V=H8<8 ;V:0@AL:8<8 70A>10<8 B0 V=HV 2848 270T<>4V9.

=0;0?@8;

V?>B5=782=0 B5@0?VO

!C?CB=V9 ?@89>< F8E ?@5?0@0BV2 <65 ?>A8;8B8 3V?>B5=782=89 5D5:B 5=0;0?@8;C. !C?CB=V9 ?@89>< 7 =VB@>3;VF5@8=><, V=H8<8 =VB@0B0<8 01> V=H8<8 207>48;0B0B>@0<8 <65 4>40B:>2> 7<5=H8B8 0@B5@V0;L=89 B8A:.

0;V9715@V30NGV 4VC@5B8:8 01> 4>102:8 7 :0;VT<

=3V1VB>@8 \$?>A8;NNBL A?@8G8=5=C 4VC@5B8:0<8 2B@0BC :0;VN. 0AB>AC20==O :0;V9715@V30NG8E 4VC@5B8:V2 (=0?@8;:04 A?V@=>:0:B=>C, 5?;5@5=>=C, B@V0 0@84C), 0 B0:>6 70AB>AC20==O E0@G>28E 4>102>: 01> A>;L>28E 70 A>2C20B8 7 >15@56=VABN, @53C;O@=> 287=0G0NG8 @V25=L :0;VN 2 A8@>20BFV :@>2V (482. @>74V;«A>1;82>ABV 70AB>AC20==O»).

VC@5B8:8 (BV0784=V 01> ?5B;L>2V 4VC@5B8:8)

>?5@54=T ;V:C20==O 4VC@5B8:0<8 C 25;8:8E 4>70E <65 ?@8725AB8 4> 7=865==O >1TW :@>2V B0 ?V428I5==O @878:C 0@B5@V0;L=>W 3V?>B5=7VW =0 ?>G0B:C B5@0?VW 5=0;0?@8;< (482. @>74V; «A>1;82>ABV 70AB>AC20==O»). V?>B5=782=V 5D5:B8 <6=0 7<5=H8B8 H;OE>< ?@8?8=5==O ?@89> 1□T6820==O A>;V G8 O:I> @>7?>G0B8 B5@0?VN 7 =87L:>W 4>78 5=0;0?@8;C.

@8B84V015B8G=V ?@5?0@0B8

?V45;>3VG=V 4>A;V465==O ?>:070;8, I> ACAC20==O V=3V1VB>@V2 \$ B0 ?@>B84V015B8G=8E ?@5?0@0BV2 (V=AC;V=C, ?5@>@0;L=8E 3V?>3;V:51V2) <65 A?@8G8=8B8 7=865==O @V2=O 3;N:>78 2 :@>2V 7 @878:>< @>728B:C 3V?>3;V:5<5= =091V;LH 2V@>3V4=89 ?@>B03< ?5@H8E B86=V2 AC3> ?@89>2>N =54>AB0B=VABN (482. @>74V;8 «A>1;82>ABV 70AB>AC20==O», «>1VG=V @50:FVW»).

VBV9 A8@>20B:8 :@>2V

@8 >4=>G0A=>AC20==V V=3V1VB>@V2 \$ V ;VBVN ?>2V4<;O;8 ?@> >1>@>B=V ?V428I5==O @V2=O ;VBVN 2 A8@>20BFV :@>2V B0 B>:A8G=VABL. !C?CB=V9 ?@89>< V=3V1VB>@V2 \$ B0 BV0784=8E 4VC@5B8:V2 <65 4>40B:>2> 71V;LH8B8 @V2=V ;VBVN 2 A8@>20BFV :@>2V B0 ?V428I8B8 @878: V=B>:A8:0FVW ;VBVT<5=4CTBLAO ?@89>< 5=0;0?@8;C 7 ;VBVT<, 0;5 O:I> B0:0 :> <1V=0FVO T =5>1EV4=>N 4;O ?0FVT=B0, A;V4 74V9A=N20B8 @5B5;L=89 <=>VB>@8=3 @V2=V2 ;VBVN C A8@>20BFV :@>2V (482. @>74V; «A>1;82>ABV 70AB>AC20==O»).

"@8F8:;VG=V 0=B845?@5A0=B8/=59@>;5?B8:8/0=5AB5B8:8/A=>4V9=V

!C?CB=V9 ?@89>< ?52=8E 0=5AB5B8:V2, B@8F8:;VG=8E 0=B845?@5A0=V2 B0 =59@>;5?B8:V2 7 V=3V1VB>@0<8 \$ <65 ?@8725AB8 4> 4>40B:>2>3> 7=865==O 0@B5@V0;L=>3> B8A:C (482. @>74V; «A>1;82>ABV 70AB>AC20==O»).

5AB5@>W4=V ?@>B870?0;L=V 70A>18, 2;:NG0NG8 A5;5:B82=V V=3V1VB>@8 F8:;>>:A835=078-2

5AB5@>W4=V ?@>B870?0;L=V 70A>18 (), 2;:NG0NG8 A5;5:B82=V V=3V1VB>@8 F8:;>>:A835=078-2

(&-2- V=3V1VB>@8), <6CBL 7=86C20B8 5D5:B 4VC@5B8:V2 B0 V=H8E 0=B83V?5@B5=782=8E

?@5?0@0BV2. ">B5=782=89 5D5:B 0=B03>=VABV2 @5F5?B>@V2 0=3V>B5=78=CII 01>

V=3V1VB>@V2 \$ <65 1CB8 >A;01;5=89 =5AB5@>W4=8<8 ?@>B870?0;L=8<8 70A>10<8, 2;:NG0NG8

A5;5:B82=V V=3V1VB>@8 &-2.

4=>G0A=89 ?@89><, 2;:NG0NG8 &-2-V=3V1VB>@8, B0 0=B03>=VABV2 @5F5?B>@V2 0=3V>B5=78=C

II 01> V=3V1VB>@V2 \$ A?@8G8=OT 048B82=89 5D5:B =0 ?V428I5==O :0;VN A8@>20B:8 :@>2V B0

<65 ?@8725AB8 4> ?>@CH5==O DC=:FVW =8@>:. 0728G09 FV O28I0 >1>@>B=V.

@V4:0 <6;820 3>AB@0 =8@:>20 =54>AB0B=VABL, >A>1;82> C 45O:8E ?0FVT=V2 7 ?>@CH5==O<

DC=:FVW =8@>: (=0?@8;:04, C ?0FVT=V2 ;VB=L>3> 2V:C 01> ?0FVT=V2 7V 7=865=8< >1T<><

F8@:C;NNG>W :@>2V, 2::NG0NG8 B8E, EB> ?@89<0T 4VC@5B8:8). "<1V=0FVN A;V4 22>48B8 7
>15@56=VABN ?0FVT=B0< 7 ?>@CH5==O<8 DC=:FVW =8@>:. 0FVT=B8 ?>28==V A?>6820B8
4>AB0B=N :V;L:VABL @V48=8 B0 7=0E>48B8AL ?V4 @5B5;L=8< :>=B@>;5< DC=:FVW =8@>: =0
?>G0B:C AC?CB=L>W B5@0?VW B0 ?5@V>48G=> ?@>B03< B0:>3> ;V:C20==O.
>42V9=0 1;>:040 @5=V=-0=3V>B5=78=-0;L4>AB5@>=>2>W A8AB5<8 (RAAS)
>42V9=0 1;>:040 (=0?@8::04, ?@8 4>4020==V V=3V1VB>@C \$ 4> 0=B03>=VAB0 @5F5?B>@0
0=3V>B5=78=C) ?>28==0 >1<56C20B8AO BV;L:8 >:@5<8<8 28?04:0<8 7 @5B5;L=8< :>=B@>;5<
0@B5@V0;L=>3> B8A:C, DC=:FVW =8@>: V @V2=V2 5;5:B@>;VBV2. V4 G0A 45:V;L:>E 4>A;V465=L
?>2V4><;O;>AO, I> C ?0FVT=BV2 7V 2AB0=>2;5=8< 0B5@>A;;5@>B8G=8< C@065==O< AC48=
A5@F52>N =54>AB0B=VABN 01> 4V015B< 7 :V=F528< C@065==O< >@30=V2 ?>42V9=0 1;>:040
@5=V=-0=3V>B5=78=-0;L4>AB5@>=>2>W A8AB5<8 ?>2070=0 7 28I>N G0AB>B>N 0@B5@V0;L=>W
3V?>B5=7VW, =5?@8B<=8E AB0=V2, 3V?5@:0;VT3V@H5==O DC=:FVW =8@>: (C B>AB@>N
=8@:>2>N =54>AB0B=VABN) ?>@V2=O=> 7 B0:>N ?@8 70AB>AC20==V >4=>3> ?@5?0@0BC, I>
2?;820T =0 @5=V=-0=3V>B5=78=-0;L4>AB5@>=>2C A8AB5A>2C20B8 =78:A® C> 7 0;VA:V@5=<
?0FVT=B0< 7 FC:@>28< 4V015B<< 01> 7 ?>@CH5==O< DC=:FVW =8@>:
((\$ < 60 <;/E2/1,73 <2) (482. @>74V;8 «@>B8?>:070==O) 01> «A>1;82>ABV 70AB>AC20==O»)).
@5?0@0B8 7>;>B0
@V4:0 ?>2V4><;O;>AO ?@> =VB@8B>W4=V @50:FVW (A8<8, I> 2::NG0NBL =01@O: >1;8GGO,
=C4>BC, 1;N20==O B0 0@B5@V0;L=C 3V?>B5=7VN) C ?0FVT=BV2, O:V ;V:C20;8AO V=T:FV9=8<8
?@5?0@0B0<8 7>;>B0 (=0B@VN 0C@>BV><0;0B) B0 AC V=3V1VB>@<< \$, C B>
!8
!8
!78@B 5B8;>289
!78@B 5B8;>289 ?V4A8;NT 3V?>B5=782=89 5D5:B V=3V1VB>@V2 \$.
F5B8;A0;VF8;>20 :8A;>B0, B@><I>;VB8:8 B0 β-1;>:0B>@8
=0;0?@8; <>6=0 157?5G=> 70AB>A>2C20B8 AC?CB=L> 7 0F5B8;A0;VF8;>2>N :8A;>B>N (2
:0@4V>;>3VG=8E 4>70E), B@><1>;VB8:0<8 B0 β-1;>:0B>@0<8.
!C?CB=O B5@0?VO V=3V1VB>@<< \$ B0 0=B03>=VAB><< @5F5?B>@V2 0=3V>B5=78=C
>2V4><;O;>AO, I> C ?0FVT=BV2 7 ?V4B25@465=>N 0B5@>A;;5@>B8G=>N E2>@>1>N, A5@F52>N
=54>AB0B=VABN 01> 7 FC:@>28< 4V015B<< 7 C@065==O< :V=F52>3> >@30=0 AC?CB=O B5@0?VO
V=3V1VB>@<< \$ B0 0=B03>=VAB><< @5F5?B>@V2 0=3V>B5=78=C 0A>FVNTBLAO 7 28I>N
G0AB>B>N ?>O28 0@B5@V0;L=>W 3V?>B5=7VW, A8=>?5, 3V?5@:0;VT3V@H5==O DC=:FVW =8@>:
(2::NG0NG8 3>AB@C =8@:>2C =54>AB0B=VABL) ?>@V2=O=> 7 B0:>N ?@8 70AB>AC20==V BV;L:8
?@5?0@0BC @5=V=-0=3V>B5=78=-0;L4>AB5@>=>2>W A8AB5<8. >42V9=0 1;>:040 (=0?@8::04, :>
<1V=C20==O< V=3V1VB>@C \$ 7 0=B03>=VAB><< @5F5?B>@V2 0=3V>B5=78=C) ?>28==0 >1
<56C20B8AL V=482V4C0;L=> 287=0G5=8<8 28?04:0<8 B0 AC?@>2>46C20B8AO @5B5;L=8<
<>=VB>@8=3><< DC=:FVW =8@>:, @V2=V2 :0;VN B0 0@B5@V0;L=>3> B8A:C.
=40?0
5@5:><5=4>20=V :><1V=0FVW
VBV9. >6;825 ?V428I5==O @V2=O ;VBVN C ?;072V B0 ?>O20 A87C20==O, O: V ?@8 157A>;L>2V9
4VTBV (7=865==O 5:A:@5FVW ;VBVN 7 A5G5N). !:I> =5>1EV4=> ?@87=0G8B8 4VC@5B8:, A;V4
?@>25AB8 @5B5;L=89 <>=VB>@8=3 @V2=O ;VBVN C ?;072V B0 040?BC20B8 4>7C ;VBVN.
><1V=0FVW, I> ?>B@51CNBL >15@56=>ABV
@5?0@0B8, I> <>6CBL A?@8G8=8B8 28=8:=5==O ?0@>:A87<0;L=>W H;C=>G:>2>W B0EV:0@4VW
B8?C «?V@C5B»:

0=B80@8B:2V=V48=, 487>?V@0

0=B80@8B40@>=, A>B0;>;, 4>D5B8;V4, V1CB8;V4);

45O:V 0=B8?A8E>B8G=V ?@5?0@0B8:

D5=>BV078=8 (E;>@?@<078=, FV0<5<078=, ;52><5?@<078=, BV>@84078=,
B@8D;C>?5@078=);

15=70?@84, BV0?@84);

1CB8@>D5=>=8 (4@>?5@84>;, 30;>?5@84>;);

□V=HV ;V:0@AL:V 70A>18: 15?@848;, F870?@84, 48D5<0=V;, 5@8B@>25==89, 30;>D0=B@8=, ;0AB8=, ?5=B0:A0F8=, <:>:A8D;>:A0F8=, 2V=:025==89.

@8 70AB>AC20==V V=40?0:@5<0 torsades de pointes ?0@>:A87<0;L=>W H;C=>G:>2>W B0EV:0@4VW B8?C «?V@C5B» (3V?>:0;VT@>< @878:C).

5@54 ?@87=0G5==O< B0:>W :<1V=0FVW A;V4 ?5@52V@8B8 @V25=L :0;VN B0 C @07V

=5>1EV4=>ABV 2V4:>@83C20B8 9>3>. !;V4 :=B@>;N20B8 ;;V=VG=89 AB0=?0FVT=BV2,

5;5:B@>;VB8 ?;07<8 B0 . @8 =002=>ABV 3V?>:0;VT<5=4>20=> ?@87=0G0B8 ?@5?0@0B8, I> =5

A?@8G8=ONBL torsades de pointes.

5AB5@>W4=V ?@>B870?0;L=V ?@5?0@0B8 (4;O A8AB5<=>3> ?@87=0G5==O), 2;:NG0NG8

A5;5:B82=V V=3V1VB>@8 F8;:>>:A835=078 2, 25;8:V 4>78 A0;VF8;0BV2 (≥ 3 3/4>1C):

□<>6CBL 7<5=HC20B8 0=B83V?5@B5=782=89 5D5:B V=40?0

□C 7=52>4=5=8E ?0FVT=BV2 ?V428ICTBLAO @878: 28=8:=5==O 3>AB@>W =8@:>2>W

=54>AB0B=>ABV (G5@57 7=865==O 3;><5@C;O@=>W DV;LB@0FVW). 5@54 ?>G0B:< ;V:C20==O

=5>1EV4=> 2V4=>28B8 2>4=89 10;0=A B0 ?5@52V@8B8 DC=:FVN =8@>:.

=3V1VB>@8 \$. >6;825 @0?B>25 28=8:=5==O 0@B5@V0;L=>W 3V?>B5=7VW B0/01> 3>AB@>W

=8@:>2>W =54>AB0B=>ABV C ?0FVT=BV2 7V 7=865=8< @V2=5< =0B@VN (>A>1;82> C ?0FVT=BV2

7V AB5=>7< =8@:>2>W 0@B5@VW).

@B5@V0;L=0 3V?5@B5=7V0. /!> ?>?5@54=T 70AB>AC20==O 4VC@5B8:0 28;:8;0;> 7=865==O @V2=O

=0B@VN, =5>1EV4=> 70 3 4>18 4> ?>G0B:C ;V:C20==O V=3V1VB>@<

0=3V>B5=78=?5@5B2>@N20;L=>3> D5@<5=BC (\$) ?@8?8=8B8 ?@89<< 4VC@5B8:0 B0 ?>BV< C @07V

=5>1EV4=>ABV 2V4=>28B8 B5@0?VN 4VC@5B8:<< 01> @>?>G0B8 ?@89<< V=3V1VB>@C \$ 7

=87L:>W ?>G0B:>2>W 4>78 V7 ?>40;LH8< ?>ABC?>28< WW ?V428I5==O

@8 70ABV9=V9 A5@F52V9 =54>AB0B=>ABV 70AB>AC20==O V=3V1VB>@C \$ A;V4 @>?>G8=0B8 7

1C4L-O:> =5>1EV4=> ?@>2>48B8 :=B@>;L DC=:FVW =8@>: (:@50B8=V=C ?;07<8) ?@>BO3<< ?5@H8E

B86=V2 ;V:C20==O V=3V1VB>@<< \$.

@5?0@0B8, I> <>6CBL A?@8G8=8B8 3V?>:0;VT- B0 :>@B8:>W48 (4;O A8AB5<=>3> ?@87=0G5==O), 0

B5@8F8= (2=CB@VH=L>25==89), B5B@0:>70:B84, ?@>=>A=V ?@5?0@0B8, I> AB8 ?V428ICNBL

@878: 28=8:=5==O 3V?>:0;VT=B@>;N20B8 B0 C @07V =5>1EV4=>ABV ?@>2>48B8 :>@5:FVN :0;VN C

?;072V, >A>1;82C C203C A;V4 ?@84V;OB8 >4=>G0A=V9 B5@0?VW V7 A5@F528&8 3;V:>7840<8. 5:>

<5=4CTBLAO ?@87=0G0B8 ?@>=>A=V ?@5?0@0B8, I> =5 AB8

!5@F52V 3;V:>7848. 002=VABL 3V?>:0;VTB>:A8G=>ABV A5@F528E 3;V:>784V2. !;V4 ?@>2>48B8

<>=VB>@8=3 :0;VN C ?;072V, -:>=B@>;L B0 C @07V =5>1EV4=>ABV :>@83C20B8 ;V:C20==O.

0;:>D5=?>A8;NT 0=B83V?5@B5=782=C 4VN ?@5?0@0BC. 0 ?>G0B:C B5@0?VW =5>1EV4=> 2V4=>28B8

2>4>=>-5;5:B@>;VB=89 10;0=A ?0FVT=B0 B0 :=B@>;N20B8 DC=:FVN =8@>:.

><1V=0FVW, I> ?>B@51CNBL C2038

0;V9715@V30NGV 4VC@5B8:8 (0@84, A?V@>=>;0:B>=, B@80 /!> VA=CT 4>FV;L=VABL

?@87=0G5==O B0:>W :<1V=0FVW, =5 28;:NG0TBLAO <>6;82VABL 28=8:=5==O 3V?>:0;VTA>1;82> C

E2>@8E =0 FC:@>289 4V015B 01> V7 =8@:>2>N =54>AB0B=VABN) 01> 3V?5@:0;VT2>48B8

<>=VB>@8=3 @V2=O :0;VN C ?;072V, -:>=B@>;L B0 C @07V =5>1EV4=>ABV :>@83C20B8 B5@0?VN.

5BD>@ V428ICTBLAO @878: 28=8:=5==O <>:>G=>:8A;>3> 0F84>7C C @07V @>728B:C

DC=:FV>=0;L=>W =8@:>2>W =54>AB0B=>ABV 2=0A;V4>: ?@89>A>1;82> ?5B;L>28E. 5 A;V4

?@87=0G0B8 <5BD>@ @V25=L :@50B8=V=C C ?;072V ?5@528ICT 15 <3/; (135

>4>:>=B@0AB=V 70A>18. # @07V 453V4@0B0FVW, A?@8G8=5=>W ?@89><< 4VC@5B8:V2,

71V;LHCTBLAO @878: @>728B:C 3>AB@>W =8@:>2>W =54>AB0B=>ABV, >A>1;82> ?@8

70AB>AC20==V 25;8:8E 4>7 9>4>:=B@0AB=8E 70A>1V2. 5>1EV4=> 2V4=>28B8 2>4=89 10;0=A 4>

?@87=0G5==O 9>4>:=B@0AB=8E 70A>1V2.

?>4V1=V 0=B845?@5A0=B8, =59@>;5?B8:8. >A8;5==O 0=B83V?5@B5=782=>3> 5D5:BC B0 @878:C

@>728B:C >@B>AB0B8G=>W 3V?>B5=7VW 70 @0EC=>: 048B82=>3> 5D5:BC.

!>;V :0;LFVN. >6;825 28=8:=5==O 3V?5@:0;LFVT: 7=865==O 5;V

?>A?>@8=, B0:@>;V 878: ?V428I5==O :@50B8=V=C C ?;072V 157 2?;82C =0 @V25=L F8@:C;NNG>3> F8:;>A?>@8=C, =02VBL C @07V 2V4ACB=>ABV 7=865==O @V2=O 2>48/=0B@VN.
>@B8:>AB5@>W48, B5B@0:>70:B84 (A8AB5<=>W 4VW). <5=H5==O 0=B83V?5@B5=782=>W 4VW
V=40?0: 70B@848 B0 V=>V2 =0B@VN ?V4 2?;82< :>@B8:>AB5@>W4V2.

A>I;82>ABV 70AB>AC20==O.

=0;0?@8;

!8<0B8G=0 3V?>B5=7VO

!8<0B8G=C 3V?>B5=7VN @V4:> A?>AB5@V30NBL C ?0FVT=BV2 7 =5CA:;04=5=>N 0@B5@V0;L=>N
3V?5@B5=7VTN. # ?0FVT=BV2 7 0@B5@V0;L=>N 3V?5@B5=7VTN, O:V >B@8, A8<0B8G=0
3V?>B5=7VO @>72820TBLAO G0ABVH5 ?@8 3V?>2>;5: B5@0?VW 4VC@5B8:0<8, >1<565==O
26820==O A>;V, C ?0FVT=BV2, O:V ?5@51C20NBL =0 35<>4V0;V7V, 0 B0:>6 C E2>@8E 7 4V0@5TN
01> 1;N20==O< (482. @>74V;8 «70T<>4VO 7 V=H8<8 ;V:0@AL:8<8 70A>10<8 B0 V=HV 2848 270T
<>4V9» B0 <>1VG=V @50:FVW»). !8<0B8G=C 3V?>B5=7VN A?>AB5@V30;8 9 C ?0FVT=BV2 V7
A5@F52>N =54>AB0B=VABN, O:0 AC?@>2>46C20;0AO 01> =5 AC?@>2>46C20;0AO =8@:>2>N
=54>AB0B=VABN. !8<0B8G=0 3V?>B5=7VO @>72820;0AO G0ABVH5 C ?0FVT=BV2 7 1V;LH B06:8<8
D>@<0<8 A5@F52>W =54>AB0B=>ABV, O:8< 70AB>A>2C20;8 28IV 4>78 ?5B;L>28E 4VC@5B8:V2, 7
3V?>=0B@VT ?>@CH5==O<8 DC=:FVW =8@>:. "0:8< ?0FVT=B0< ;V:C20==O =78:A> A;V4 ?>G8=0B8
?V4 =03;04<< ;V:0@O. @8 778 =78:AC® C> B0/01> 4VC@5B8:0 =03;04 <0T 1CB8 >A>1;82> @5B5;L=8
3VG=8< G8=>< A;V4 25AB8 A?>AB5@565==O 70 ?0FVT=B0<8 7 VH5N E2>@>1>N A5@FO, 0 B0:>6 V7
70E2>@N20==O<8 AC48=< >7:C, C O:8E =043> B8A:C <>65 ?@8725AB8 4> V=D0@:BC :0@40 01>
V=AC;LBC.

@8 @>728B:C 0@B5@V0;L=>W 3V?>B5=7VW E2>@>@87>=B0;L=>3> ?>;>65==O B0, O:I> =5>1EV4=>,
225AB8 2=CB@VH=L>25==> DV7V>;>3VG=89 @>7G8=. "@0=78B>@=0 0@B5@V0;L=0 3V?>B5=7VO
?@8 ?@89> =5 T ?@>B8?>:070==O< 4;O ?>40;LH>3> ?@89>

450:8E ?0FVT=BV2 V7 A5@F52>N =54>AB0B=VABN 7 =>@<0;L=8< 01> 7=865=8< B8A:>< =78:A® C>
<>65 4>40B:>2> 7=878B8 @V25=L 0@B5@V0;L=>3> B8A:C. "0:0 @50:FVO =0 ?@89>< ?@5?0@0BC T
>GV:C20=>N B0 70728G09 =5 T ?V4AB02>N 4;O ?@8?8=5==O ;V:C20==O. # @07V, :>;8 0@B5@V0;L=0
3V?>B5=7VO AB0T @578AB5=B=>N 4> ;V:C20==O, A;V4 7<5=H8B8 4>7C B0/01> ?@8?8=8B8
;V:C20==O 4VC@5B8:<< B0/01> =78:A>.

>@B0;L=89 01> 7/3V?5@B@>DVG=0 :0@4V?>0BVO

/: V 2AV 207>48;0B0B>@8, V=3V1VB>@8 \$ A;V4 ?@87=0G0B8 7 >15@56=VABN ?0FVT=B0< 7
>1AB@C:FVTN 28EV4=>3> >B2>@C ;V2>3> H;C=>G:0 B0 >1AB@C:FVTN H;OEC 2V4B>.C; WE=L>3>
?@89>35==>3> H>:C B0 35<>48=0 7=0G=>W >1AB@C:FVW.

>@CH5==O DC=:FVW =8@>:

0FVT=B0< 7 ?>@CH5==O< DC=:FVW =8@>: (;V@5=A :@50B8=V=C < 80 <;/E2) ?>G0B:>2C 4>7C

5=0;0?@8;C A;V4 ?V418@0B8 73V4=> 7 ;;V@5=A<< :@50B8=V=C (482. @>74V; «!?!>AV1

70AB>AC20==O B0 4>78») B0 =040;V 7 2V4?>2V44N =0 ;V:C20==O. ;O B0:8E ?0FVT=BV2

AB0=40@B=>N <548G=>N ?@0:B8:>N T @53C;O@=89 :>=B@>;L 2

@> ?>@CH5==O DC=:FVW =8@>: ?>2V4<<;O;8 C 72O7:C 7 ?@89><< 5=0;0?@8;C, I> 3>;>2=8< G8=><

A?>AB5@V30;>AL C ?0FVT=BV2 7 B06:>N A5@F52>N =54>AB0B=VABN 01> 7 70E2>@N20==O<

=8@>:, 2;;NG0NG8 AB5=>7 0@B5@VW =8@>:. @8 A2>TG0A=>2V4=>20 =54>AB0B=VABL, ?>2O70=0 7

B5@0?VTN 5=0;0?@8;<<, 70728G09 <0T >1>@>B=89 E0@0:B5@.

450:8E ?0FVT=BV2 7 3V?5@B5=7VTN, C O:8E =5 1C;> 28O2;5=> 70E2>@N20==O =8@>: 4> ?>G0B:C

;V:C20==O, 5=0;0?@8; AC 7 4VC@5B8:0<8 A?@8G8=02 70728G09 =57=0G=5 B0 A:>@<8=CG5

?V428I5==O 228=8 C :@>2V B0 :@50B8=V=C C A8@>20BFV :@>2V. # B0:8E 28?04:0E<>65 1CB8

=5>1EV4=8< 7<5=H5==O 4>78 B0/01> 2V4

5=>20A:C;O@=0 3V?5@B5=7VO

A=CT ?V428I5=89 @878: 0@B5@V0;L=>W 3V?>B5=7VW B0 =8@:>2>W =54>AB0B=>ABV, :>;8

?0FVT=B8 7 42>AB>@>==V< AB5=>7< 0@B5@V9 =8@>: 01> AB5=>7< 0@B5@VW T48=>W

DC=:FV>=CNG>W =8@:8 ;V:CNBLAO V=3V1VB>@0<8 \$. B@B0 DC=:FVW =8@>: <>6;820 265 ?@8

20BFV :@>2V. "0:8< ?0FVT=B0< ;V:C20==O A;V4 @>7?>G8=0B8<0;8<8 4>70<8 ?V4 @5B5;L=8< =03;04>

< ;V:0@O 7 >15@56=8< B8B@C20==O< B0 <=>VB>@8=3<< DC=:FVW =8@>:.

"@0=A?;0=B0FVO =8@:8

5<0T 4>A2V4C I>4> ?@89> ?0FVT=B0<8, O:V =5402=> ?5@5=5A;8 >?5@0FVN 7 B@0=A?;0=B0FVW =8@:8. ">

5GV=:>20 =54>AB0B=VABL

V4:> V=3V1VB>@8 \$ 0A>FVN20;8AL V7 A8=4@><<, I> @>?>G8=0TBLAO 7 E>;5AB0B8G=>W 6>2BO=8FV 01> 35?0B8BC B0 ?@>3@5ACT 4> <8BBT2>3> =5:@>7C ?5GV=:8 B0 (V=>4V) ;5B0;L=>3> =0A;V4:C. 5E0=V7< FL>3> A8=4@>20=8

59B@>?5=VO/03@0=C;>F8B>7

?0FVT=BV2, O:V ?@89<0;8 V=3V1VB>@8 \$, ?>2V4<<;O;>AO ?@> ?>O2C =59B@>?5=VW /03@0=C;>F8B>7C, B@><1>F8B>?5=VW B0 0=5@<0;L=>N DC=:FVTN =8@>: B0 ?@8 2V4ACB=>ABV V=H8E CA:;04=NNG8E D0:B>@V2 =59B@>?5=VO 28=8:0;0 @V4:>. =0;0?@8; A;V4 ?@87=0G0B8 4C65 >15@56=> ?0FVT=B0< 7 :>;035=>7<< AC48=, O:V ?@>E>4OBL VAC?@5A82=C B5@0?VN, ;V:C20==O 0;>?C@8=>;<< 01> ?@>:0W=0<, 01> ?@8 :<<1V=0FVW F8E CA:;04=NNG8E D0:B>@V2, >A>1;82> O:I> 265 VA=CT ?>@CH5==O DC=:FVW =8@>:. # 45O:8E V7 F8E ?0FVT=BV2 @>72820;8AL A5@9>7=V V=D5:FVW, O:V V=>4V =5 2V4?>2V40;8 =0 V=B5=A82=C B5@0?VN 0=B81V>B8:0<8. @8 ?@87=0G5==V 5=0;0?@8;C B0:8< ?0FVT=B0< @5:><5=4CTBLAO ?5@V>48G=89 <=>VB>@8=3 :V;L:>ABV ;59:>F8BV2, 0 ?0FVT=B8 ?>28==V ?>2V4<<;OB8 ?@> 1C4L-O:89 ?@>O2 V=D5:FVW. V?5@GCB;82VABL/0=3V>=52@>B8G=89 =01@O:

@8 70AB>AC20==V V=3V1VB>@V2 \$, C B.G. =78:AC@ C>, 1C;8 >?8A0=V ?>>48=>:V 28?04:8 0=3V>=52@>B8G=>3> =01@O:C>1;8GGO, :V=FV2>:, 3C1, O78:0, 3>;>A>2>W IV;8=8 B0/01> 3>@B0=V, I> 28=8:02 C @V7=V ?5@V>48 ;V:C20==O. # F8E 28?04:0E A;V4 =5309=> ?@8?8=8B8 ;V:C20==O =78:A> V 2AB0=>28B8 ?>ABV9=5 A?>AB5@565==O 70 ?0FVT=B<<, I>1 C?52=8B8AL C ?>2=>3> A?>AB5@565==O <<6=0 ?@8?8=8B8. 02VBL B>4V, :>;8 2V41C20TBLAO =01@O: BV;L:8 O78:0 157 ?>@CH5==O 48E0==O, ?0FVT=B8 <<6CBL ?>B@51C20B8 ?>4>265=>3> A?>AB5@565==O, >A:V;L:8 ;V:C20==O 0=B83VAB0

C65 @V4:> ?>2V4<<;O;>AO ?@> ;5B0;L=89 =0A;V4>: G5@57 0=3V>=52@>B8G=89 =01@O: 3>@B0=V 01> =01@O: O78:0. # @07V, :>;8 =01@O: ;>:0;V7CTBLAO 2 4V;O=FV O78:0, 3>;>A>2>W IV;8=8 01> 3>@B0=V, >A>1;82> C ?0FVT=BV2 7 EV@C@3VG=8<8 2B@CG0==O<8 =0 48E0;L=8E H;OE0E 2 0=0 <=57V, <<65 @>728=CB8AO >1AB@C:FVO 48E0;L=8E H;OE2. >;8 T 70;CG5==O O78:0, 3>;>B:8 01> 3>@B0=V 4> ?@>F5AC B0 F5 <<65 A?@8G8=8B8 >1AB@C:FVN 48E0;L=8E H;OE2, A;V4 =5309=> @>?>G0B8 2V4?>2V4=C B5@0?VN, O:0 <<65 2;;NG0B8 ?V4H:V@=5 22545==O @>7G8=C 04@5=0;V=C 1:1000 (0,3-0,5 <,) V/01> 70E>48 4;O 70157?5G5==O ?@>EV4=>ABV 48E0;L=8E H;OE2. # ?@54AB02=8:V2 =53@>W4=>W @0A8, O:V 70AB>A>2C20;8 V=3V1VB>@8 \$, G0ABVH5 28=8:02 0=3V>=52@>B8G=89 =01@O: ?>@V2=O=> V7 ?0FVT=B0<8 V=H8E @0A.

0FVT=B8 7 0=3V>=52@>B8G=8< =01@O:>< 2 0=0<=57V, O:89 =5 ?>2O7CNBL V7 70AB>AC20==O< V=3V1VB>@V2 \$, <<6CBL <0B8 ?V428I5=89 @878: 9>3> 28=8:=5==O V ?@8 ;V:C20==V V=3V1VB>@> < \$ (482. B0:>6 @>74V; «@>B8?>:070==O»).

=0DV;0:B>W4=V @50:FVW ?V4 G0A ?@>2545==O 3V?>A5=A81V;V70FVW 0;5@35=<< 7 >B@CB8 ?5@5B8=G0AB>:@8;8E

@V4:0 C ?0FVT=BV2, O:V >B@8@8 \$?V4 G0A ?@>2545==O 3V?>A5=A81V;V70FVW 0;5@35=<< 7 >B@CB8 ?5@5B8=G0AB>:@8;8E, @>72820;8AL 0=0DV;0:B>W4=V @50:FVW, I><<3;8 1CB8 703@>7;828<8 4;O 68BBO ?0FVT=BV2. >4V1=8E @50:FV9 <<6=0 C=8:=CB8, O:I> 4> ?>G0B:C 3V?>A5=A81V;V70FVW B82> ?@8?8=8B8 ?@89><< V=3V1VB>@C \$.

=0DV;0:B>W4=V @50:FVW ?@>BO3<< 0D5@57C ;V?>?@>B5W4V2 =87L:>W IV;L=>ABV V4:> C ?0FVT=BV2, O:V ?@89<0;8 V=3V1VB>@8 \$?@>BO3<< 0D5@57C ;V?>?@>B5W4V2 =87L:>W IV;L=>ABV 7 45:AB@0=C AC;LD0B<<, 28=8:0;8 0=0DV;0:B>W4=V @50:FVW, I> AB0=>28;8 703@>7C 68BBN. "0:8E @50:FV9 <<6=0 C=8:=CB8 H;OE><< B82>3> ?@8?8=5==O ?@89>@V2 \$?5@54 :>6=8< 0D5@57>

0FVT=B8, O:V ?5@51C20NBL =0 35<<4V0;V7V

?0FVT=BV2, O:V ?5@51C20NBL =0 4V0;V7V V7 28:>@8AB0==O< <5<1@0= 28A>:>W ?@>?CA:=>W 740B=>ABV (=0?@8;;04 AN 69@) V 70AB>A>2CNBL >4=>G0A=> V=3V1VB>@ \$, V=>4V @>72820;8AO 0=0DV;0:B>W4=V @50:FVW. ">5=4CTBLAO @>73;O=CB8 ?8B0==O ?@> 70AB>AC20==O 4V0;V7=8E <5<1@0= V=H>3> B8?C 01> 3V?>B5=782=>3> 70A>1C V=H>W 3@C?8.

V?>3;V:5

0FVT=B0< V7 FC:@>28< 4V015B><, O:V ?@89<0NBL ?5@>@0;L=V 0=B84V015B8G=V ?@5?0@0B8 G8
V=AC;V= B0 ?>G8=0NBL B5@0?VN V=3V1VB>@> \$, A;V4 @5:>5=4C20B8 @5B5;L=> ?5@52V@OB8
@V2=V FC:@C 2 :@>2V, >A>1;82> ?@>BO3> ?5@H8E 45;V;L:>E 3> 70AB>AC20==O (482. @>74V;
«70T<>4VO 7 V=H8<8 ;V:0@AL:8<8 70A>10<8 B0 V=HV 2848 270T<>4V9»).

0H5;L

>2V4><;O;>AO ?@> 28=8:=5==O :0H;N ?@8 ;V:C20==V V=3V1VB>@0<8 \$. 0728G09 :0H5;L =>A8BL
=5?@>4C:B82=89 ABV9:89 E0@0:B5@ V ?@8?8=OTBLAO ?VA;O 2V4 ;V:C20==O V=3V1VB>@> \$
=5>1EV4=> 2@0E>2C20B8 ?@8 48D5@5=FV9=V9 4V03=>AB8FV :0H;N.

@>2545==O EV@C@3VG=8E >?5@0FV9/0=5AB57VO

V4 G0A 25;8:8E EV@C@3VG=8E >?5@0FV9 01> ?@8 0=5AB57VW V7 70AB>AC20==O< ?@5?0@0BV2,
O:V A?@8G8=ONBL 0@B5@V0;L=C 3V?>B5=7VN, 5=0;0?@8; 1;>:CT CB2>@5==O 0=3V>B5=78=C II
2B>@8==> 4> :>@=>3> 72V;L=5==O @5=V=C. /:I> ?@8 FL>72820TBLAO 0@B5@V0;L=0 3V?>B5=7VO,
O:C <>6=0 ?>OA=8B8 F8<8 <5E0=V7<0<8 270T<>4VW, 2>=0 :>@83CTBLAO H;OE> 71V;LH5==O >1T
V?5@:0;VT

@>BO3>< ;V:C20==O V=3V1VB>@0<8 \$, 2;;NG0NG8 5=0;0?@8;; C 450:8E ?0FVT=BV2

A?>AB5@V30;>AO ?V428I5==O @V2=O :0;VN 2 :@>2V. 878: 28=8:=5==O 3V?5@:0;VT2>N
=54>AB0B=VABN, 7 ?>3V@H5=>N DC=:FVTN =8@>;, 2V:> > 70 @>:V2, V7 FC:@>28< 4V015B><,
B@0=78B>@=8<8 AB0=0<8, 7>:@5<0 7=52>4=5==O<, 3>AB@>N A5@F52>N 45;>;VG=8< 0F84>7>< B0
AC?CB=V< ?@89><< :0;V9715@V30NG8E 4VC@5B8:V2 (=0?@8;;04 A?V@=>=>;0:B>=C, 5?;5@5=>=C,
B@V0 0@84C); ?@8 28:>@8AB0==V E0@G>28E 4>102>: 01> A>;L>28E 70 6 C ?0FVT=BV2, O:V ?@89
<0NBL V=HV ?@5?0@0B8, I> <>6CBL A?@8G8=8B8 ?V428I5==O :0;VN 2 :@>2V (=0?@8;;04 35?0@8=).
>:@5<0, ?@89>< :0;V9715@V30NG8E 4VC@5B8:V2, E0@G>28E 4>102>: 01> A>;L>28E 70 AC?CB=V9
?@89>< 5=0;0?@8;C B0 1C4L-O:>3> 7 28I573040=8E ?@5?0@0BV2 22060TBLAO =5>1EV4=8<, WE A;V4
70AB>A>2C20B8 7 >15@56=VABN, @53C;O@=> :>=B@>;NNG8 220BFV :@>2V (482. @>74V; «70T
<>4VO 7 V=H8<8 ;V:0@AL:8<8 70A>10<8 B0 V=HV 2848 270T<>4V9»).

VBV9

0728G09 :><1V=0FVO ;VBVN B0 5=0;0?@8;C =5 @5:><5=4>20=0 (482. @>74V; «70T<>4VO 7 V=H8<8
;V:0@AL:8<8 70A>10<8 B0 V=HV 2848 270T<>4V9»).

!C?CB=O B5@0?VO V=3V1VB>@>< \$ B0 0=B03>=VAB>< @5F5?B>@V2 0=3V>B5=78=C

><1V=C20==O V=3V1VB>@C \$ 7 0=B03>=VAB>< @5F5?B>@V2 0=3V>B5=78=C II A;V4 >1<568B8
V=482V4C0;L=> 287=0G5=8<8 28?04:0<8, O:V AC?@>2>46CNBLAO @5B5;L=8< <=>VB>@8=3><
DC=:FVW =8@>;, @V2=V2 :0;VN B0 0@B5@V0;L=>3> B8A:C (482. @>74V; «70T<>4VO 7 V=H8<8
;V:0@AL:8<8 70A>10<8 B0 V=HV 2848 270T<>4V9»).

0:B>70

A;V;L:8 ?@5?0@0B 7C, 2V= ?@>B8?>:070=89 4> 70AB>AC20==O E2>@8< 7V A?04:>28<8 ?>@CH5==O
<8 =5?5@5=>A8<>ABV 30;0:B>78, =54>AB0B=VABN ;0:B078 G8 A8=4@>><< 3;N:>7>-30;0:B>7=>W
<0;L01A>@1FVW.

=40?0

0FVT=B8 7 ?>@CH5==O< DC=:FVW ?5GV=:8

?0FVT=BV2 V7 ?>@CH5==O< DC=:FVW ?5GV=:8 70AB>AC20==O BV0784>?>4V1=8E 4VC@5B8:V2
<>65 A?@8G8=8B8 ?5GV=:>2C 5=F5D0;>?0BVN, >A>1;82> ?@8 ?>@CH5==OE 5;5:B@>;VB=>3>
10;0=AC. # B0:>< 4VC@5B8:V2 A;V4 =5309=> ?@8?8=8B8.

!2VB;>GCB;82VABL

>2V4><;O;>AO ?@> 28?04:8 @50:FV9 A2VB;>GCB;82>ABV C ?0FVT=BV2, O:V ?@89<0;8 BV0784=V B0
BV0784>?>4V1=V 4VC@5B8:8 (482. @>74V; «>1VG=V @50:FVW»). @8 28=8:=5==V B0:8E @50:FV9
;V:C20==O 4VC@5B8:0<8 @5:><5=4>20=> ?@8?8=8B8. /:I> T =5>1EV4=VABL C ?>2B>@=>FO 01> 2V4
465@5; HBCG=>3> C;LB@0DV>;5BC.

>?>28=8

@5?0@0B 7C, B>3> =5 A;V4 ?@87=0G0B8 ?0FVT=B0< 7 C@>465=>N =5?5@5=>A878, A8=4@>><<
<0;L01A>@1FVW 3;N:>78 B0 30;0:B>78, =54>AB0B=VABN ;0:B078 0?>0.

0;0=A 2>48 B0 5;5:B@>;VBV2

0B@V9

5>1EV4=> :=B@>;N20B8 @V25=L =0B@VN C ?;072V ?5@54 ?>G0B;<> ;V:C20==O B0 =040;V @53C;O@=> ?V4 G0A ;V:C20==O. C4L-O:89 4VC@5B8:<>65 A?@8G8=8B8 28=8:=5==O 3V?>=0B@VT V=>4V <0T A5@9>7=V =0A;V4:8. =865==O @V2=O =0B@VN C ?;072V <>65 1CB8 A?>G0B:C 157A8<=8 <, B>1EV4=89 @53C;O@=89 <=>VB>@8=3. >=VB>@8=3 @V2=O =0B@VN A;V4 ?@>2>48B8 G0ABVH5 C ?0FVT=BV2 ;VB=L>3> 2V:C B0 C ?0FVT=BV2 V7 F8@>7<> ?5GV=:8.

0;V9
=865==O @V2=O :0;VN C ?;072V V7 28=8:=5==O< 3V?>:0;VTA=>2=8< @878:<> ?@8 70AB>AC20==V BV0784=8E B0 BV0784>?>4V1=8E 4VC@5B8:V2. >728B>: 3V?>:0;VTN E2>@>1>N A5@FO B0 ?0FVT=B8 7 A5@F52>N =54>AB0B=VABN. # B0:8E 28?04:0E 3V?>:0;VTB>:A8G=VABL A5@F528E 3;V:>784V2 B0 @878: 28=8:=5==O 0@8B
0FVT=B8, O:V <0NBL ?>4>265=89 V=B5@20; Q" 2@>465=>3> 01> OB@>35==>3> 35=57C, B0:>6 =0;560BL 4> 3@C?8 @878:C. V?>:0;VT:@5<0 ?0@>:A87<0;L=>W H;C=>G:>2>W B0EV:0@4VW B8?C <<?V@C5B», I> <>65 ?@8725AB8 4> ;5B0;L=>3> =0A;V4:C.

CAVE 28I5707=0G5=8E 28?04:0E =5>1EV4=89 G0ABVH89 :=B@>;L @V2=O :0;VN C :@>2V. 5@H89 0=0;V7 ?>B@V1=> 7@>18B8 ?@>B03<< 1-3> B86=O ;V:C20==O. # @07V 28O2;5==O 3V?>:0;VT25AB8 WW :>@5:FVN.

0;LFV9
"V0784=V B0 BV0784>?>4V1=V 4VC@5B8:8 <>6CBL 7<5=HC20B8 5:A:@5FVN :0;LFVN V7 A5G5N B0 ?@872>48B8 4> =57=0G=>3> V B82>3> ?V428I5==O @V2=O :0;LFVN C ?;072V. 8@065=0 3V?5@:0;LFVT W4=8E 70;>7.

;N:>70 :@>2V
E2>@8E =0 FC:@>289 4V015B 206;82> :=B@>;N20B8 3;N:>7C 2 :@>2V, >A>1;82> ?@8 =0O2=>ABV 3V?>:0;VT

15G>20 :8A;>B0
?0FVT=BV2 V7 ?V428I5=8< @V2=5< A5G>2>W :8A;>B8 <>65 A?>AB5@V30B8AO B5=45=FVO 4> ?V428I5==O :V;L:>ABV =0?04V2 ?>403@8.

\$C=:FVO =8@>: B0 4VC@5B8:8
"V0784=V B0 BV0784>?>4V1=V 4VC@5B8:8 =091V;LH 5D5:B82=V, O:I> DC=:FVO =8@>: =5 ?>@CH5=0 01> O:I> ?>@CH5==O T =57=0G=8<8 (:@50B8=V=?;07<8 :@>2V <25 <3/;, B>1B> 220 <<>;L/; C 4>@>A;8E). # ?0FVT=BV2 ;VB=L>3> 2V:C @V25=L :@50B8=V=C C ?;072V ?>28=5= 2V4?>2V40B8 2V:C, <0AV BV;0 B0 AB0BV. V?>2>;2O70=0 V7 2B@0B>N 2>48 B0 =0B@VN 2=0A;V4>: 70AB>AC20==O 4VC@5B8:V2, =0 ?>G0B:C ;V:C20==O A?@8G8=OT 7=865==O 3;<5@C;O@=>W DV;LB@0FVW. &5<>65 ?@8725AB8 4> ?V428I5==O @V2=O A5G>28=8 B0 :@50B8=V=C C :@>2V. "0:0 B@0=78B>@=0 DC=:FV>=0;L=0 =8@>:20 =54>AB0B=VABL =5<0T =0A;V4:V2 2 >AV1 V7 =>@<0;L=>N DC=:FVTN =8@>:, 0;5 <>65 ?>3V@H8B8 VA=CNGC =8@>:2C =54>AB0B=VABL.

A?>@BA<5=V2 V=40?0.
0AB>AC20==O C ?5@V>4 203VB=>ABV 01> 3>4C20==O 3@C44N.
=a;0?@8;
03VB=VABL
V:0@AL:89 70AV1 =5<>6=0 70AB>A>2C20B8 203VB=8< 01> 6V=:0<, O:V ?;0=CNBL 70203VB=VB8. /:I> ?V4 G0A ;V:C20==O F8< 70A>1><< ?V4B25@46CTBLAO 203VB=VABL, 9>3> 70AB>AC20==O =5>1EV4=> =5309=> ?@8?8=8B8 V 70 =3V1VB>@8 \$?@8 70AB>AC20==V ?V4 G0A B0 B@8<5AB@V2 203VB=>ABV <>6CBL A?@8G8=OB8 D5B>B>:A8G=VABL (7=865==O DC=:FVW =8@>:, >;V3>3V4@0<=V>=, 70B@8A8DV:0FVW :VAB>: G5@5?0) 01> =5>=0B0;L=C B>:A8G=VABL (=8@>:20 =54>AB0B=VABL, 0@B5@V0;L=0 3V?>B5=7VO, 3V?5@:0;VT /:I> ?@89>< V=3V1VB>@V2 \$ 2V41C202AO ?@>B03<< B@8<5AB@C 203VB=>ABV, @5:<5=4>20=> C;LB@072C:>25 >1AB565==O =8@>: B0 G5@5?0. 0 =>2>=0@>465=8<8, <0B5@V O:8E ?@89<0;8 V=3V1VB>@8 \$, ?>B@V1=> @5B5;L=> A?>AB5@V30B8 7 <5B>N 28O2;5==O C =8E 0@B5@V0;L=>W 3V?>B5=7VW (482. @>74V;8 <<@>B8?>:070==O», <<A>1;82>ABV 70AB>AC20==O»).

>4C20==O 3@C44N
1<565=V D0@<0>:V=5B8G=V 40=V A2V4G0BL ?@> 4C65 =87L:V :=F5=B@0FVW C 3@C4=>® C> =5 @5:<5=4CTBLAO C ?5@V>4 3>4C20==O 3@C44N =54>=>H5=8E B0 =5<>2;OB C ?5@HV :V;L:0

1<565=V D0@<0>:V=5B8G=V 40=V A2V4G0BL ?@> 4C65 =87L:V :=F5=B@0FVW C 3@C4=>® C> =5 @5:<5=4CTBLAO C ?5@V>4 3>4C20==O 3@C44N =54>=>H5=8E B0 =5<>2;OB C ?5@HV :V;L:0

1<565=V D0@<0>:V=5B8G=V 40=V A2V4G0BL ?@> 4C65 =87L:V :=F5=B@0FVW C 3@C4=>® C> =5 @5:<5=4CTBLAO C ?5@V>4 3>4C20==O 3@C44N =54>=>H5=8E B0 =5<>2;OB C ?5@HV :V;L:0

1<565=V D0@<0>:V=5B8G=V 40=V A2V4G0BL ?@> 4C65 =87L:V :=F5=B@0FVW C 3@C4=>® C> =5 @5:<5=4CTBLAO C ?5@V>4 3>4C20==O 3@C44N =54>=>H5=8E B0 =5<>2;OB C ?5@HV :V;L:0

1<565=V D0@<0>:V=5B8G=V 40=V A2V4G0BL ?@> 4C65 =87L:V :=F5=B@0FVW C 3@C4=>® C> =5 @5:<5=4CTBLAO C ?5@V>4 3>4C20==O 3@C44N =54>=>H5=8E B0 =5<>2;OB C ?5@HV :V;L:0

1<565=V D0@<0>:V=5B8G=V 40=V A2V4G0BL ?@> 4C65 =87L:V :=F5=B@0FVW C 3@C4=>® C> =5 @5:<5=4CTBLAO C ?5@V>4 3>4C20==O 3@C44N =54>=>H5=8E B0 =5<>2;OB C ?5@HV :V;L:0

1<565=V D0@<0>:V=5B8G=V 40=V A2V4G0BL ?@> 4C65 =87L:V :=F5=B@0FVW C 3@C4=>® C> =5 @5:<5=4CTBLAO C ?5@V>4 3>4C20==O 3@C44N =54>=>H5=8E B0 =5<>2;OB C ?5@HV :V;L:0

B86=V2 ?VA;O =0@>465==O, >A:V;L:8 VA=CT 3V?>B5B8G=89 @878: 5D5:BV2 7 1>:C A5@F52>-
AC48==>W A8AB5<8 B0 =8@>;, 0 B0:>6 G5@57 =54>AB0B=V9 4>A2V4 C FL>® C> C ?5@V>4
3>4C20==O 3@C44N <>6=0 @>73;O40B8, O:I> ;V:C20==O =5>1EV4=5 4;O <0B5@V, 0 70 48B8=>N
1C4CBL A?>AB5@V30B8 I>4> ?>O28 1C4L-O:8E ?>1VG=8E 5D5:BV2.
=40?0

03VB=VABL

!;V4 C=8:0B8 ?@87=0G5==O 4VC@5B8:V2 203VB=8< 6V=:0< B0 =V:>;8 =5 70AB>A>2C20B8 WE 4;O
;V:C20==O DV7V>;>3VG=8E =01@O:V2 203VB=8E. VC@5B8:8 <>6CBL ?@8725AB8 4>
D5B>?:0F5=B0@=>W VH5< 70B@8ABC ?;>40.

>4C20==O 3@C44N

?5@V>4 3>4C20==O 3@C44N 70AB>AC20==O V=40?0<5=4>20=5 G5@57 =0O2=VABL 40=8E I>4>
9>3> ?@>=8:=5==O C 3@C4=5 <>;>.>.

40B=VABL 2?;820B8 =0 H284:VABL @50:FVW ?@8 :5@C20==V 02B>B@0=A?>@B× 01> V=H8<8
<5E0=V7<0<8.

/:I> 28=8:0T ?>B@510 C :5@C20==V 02B><>1V;5< 01> C @>1>BV 7 @V7=8<8 <0H8=0<8, B> A;V4
1@0B8 4> C2038 28=8:=5==O <>6;82>3> 70?0<>@>G5==O 01> =0AB0==O ?V428I5=>W 2B>
<;N20=>ABV, O:V <>6CBL B@0?;OB8AO 2=0A;V4>: 4VW 5=0;0?@8;C.

=40?0

5 2?;820T =0 ?8;L=VABL, 0;5 C @07V 28=8:=5==O =51060=8E @50:FV9 (482. @>74V; «>1VG=V
@50:FVW»), C B>2O70=8E 7V 7=865==O< 0@B5@V0;L=>3> B8A:C, >A>1;82> =0 ?>G0B:C ;V:C20==O
01> C @07V 70AB>AC20==O C :><1V=0FVW 7 V=H8< 0=B83V?5@B5=782=8< 70A>1><, 740B=VABL
:5@C20B8 02B><>1V;5< 01> ?@0FN20B8 7 V=H8<8 <5E0=V7<0<8 <>65 1CB8 ?>@CH5=0.

!/?>AV1 70AB>AC20==O B0 4>78.

0AB>A>2C20B8 C 28?04:C, :;>8 <>=>?@5?0@0B8 =55D5:B82=V.

=78:A® C>: 1 B01;5B:C 5=a;a?@8;C <0;50BC (10 <3) V 1 B01;5B:C V=40?0:07=8:V2 0@B5@V0;L=>3>
B8A:C 4>70 5=0;0?@8;C <0;50BC <>65 1CB8 71V;LH5=0 4> 42>:@0B=>3> ?@89>1C.
=0;0?@8;C <0;50B.

>70 ?@5?0@0BC AB0=>28BL 2V4 ?>G0B:>2>W 5<3 4> <0:A8<0;L=>W 20 <3, 70;56=> 2V4 ABC?5=O
0@B5@V0;L=>W 3V?5@B5=7VW B0 AB0=C ?0FVT=B0. @8 0@B5@V0;L=V9 3V?5@B5=7VW ;53:>3>
ABC?5=O @5:><5=4>20=0 ?>G0B:>20 4>70 AB0=>28BL 5-10 <3.

?0FVT=BV2 V7 4C65 0:B82>20=>N @5=V=-0=3V>B5=78=-0;L4>AB5@=>2>N A8AB5<>N (=0?@8;;04
7 @5=>20A:C;O@=>N 3V?5@B5=7VTN, ?>@CH5==O< A>;L>2>3> B0/01> @V48==>3> 10;0=AC, 45:>W
DC=:FVW 01> B06:>N 0@B5@V0;L=>N 3V?5@B5=7VTN) <>6;825 =043> B8A:C ?VA;O ?@89>

G0B:>2>W 4>78 5=0;0?@8;C. "0:8< ?0FVT=B0< @5:><5=4CTBLAO ?>G0B:>20 4>70 5 <3 01> =86G5, 0
?>G0B>; ;V:C20==O ?>28=5= ?@>E>48B8 ?V4 =03;O4<; ;V:0@O.

>?5@54=T ;V:C20==O 28A>:8<8 4>70<8 4VC@5B8:V2 <>65 ?@8725AB8 4> 45DVF8BC @V48=8 B0
@878:C 28=8:=5==O 0@B5@V0;L=>W 3V?>B5=7VW =0 ?>G0B:C B5@0?VW 5=0;0?@8;><5=4CTBLAO
?>G0B:>20 4>70 5 <3 01> =86G5.

28G09=0 ?V4B@870 20 <3 1 @07 =0 4>1C.

0:A8<0;L=0 4>1>20 4>70 5=0;0?@8;C <0;50BC - 40 <3 (4 B01;5B:8 ?> 10 <3), V=40?0

2,5 <3 (1 B01;5B:0).

@8 E@>=VG=V9 =8@:>2V9 =54>AB0B=>ABV :C(½ 1 B01;5B:0 ?> 10 <3).

VB8.

D5:B82=VABL B0 157?5:0 70AB>AC20==O?@5?0@0BC 4VBO< 282G5=V =54>AB0B=L>, B>2V9
:0B53>@VW ?0FVT=BV2.

5@54>7C20==O.

=0;0?@8;.

A=CNBL >1<565=V 40=V I>4> ?5@54>7C20==O ?@5?0@0BC. A=>2=8<8 >7=0:0<8 ?5@54>7C20==O,
73V4=> 7 =0O2=8<8 40=8<8, T 28@065=0 0@B5@V0;L=0 3V?>B5=7VO, O:0 ?>G8=0TBLAO ?@81;87=>
G5@57 6 3>48= ?VA;O ?@89>.04>N A8AB5<8 @5=V=-0=3V>B5=78=, V ABC?>@. !8<, ?>2O70=V 7
?5@54>7C20==O< V=3V1VB>@0<8 \$, <>6CBL 2;;NG0B8 F8@:C;OB>@=89 H>;, 5;5:B@>;VB=89

48A10;0=A, =8@:>2C =54>AB0B=VABL, 3V?5@25=B8;OFVN ;535=V2, B0EV:0@4VN, ?@8A:>@5=5
A5@F518BBO, 1@048:0@4VN, 70?0<>@>G5==O, B@82>6=VABL B0 :0H5;L. V2=V 5=0;0?@8;0BC C ?;07
2V, O:V ?5@528ICNBL C 100 V 200 @07V2<0:A8<0;L=V @V2=V, I> 4>AO30NBLAO ?@8 ?@89>7, 70
?>2V4><;5==O<8, @5TAB@C20;8AO ?VA;O ?@89>2V4=> 300 <3 V 440 <3 5=0;0?@8;C.
;O ;V:C20==O ?5@54>7C20==O @5:>5=4CNBLAO 2=CB@VH=L>25==V V=DC7VW V7>B>=VG=>3>
@>7G8=C. @8 ?>O2V 0@B5@V0;L=>W 3V?>B5=7VW ?0FVT=B0 A;V4 ?>:;0AB8 2 3>@87>=B0;L=5
?>;>65==O. >6=0 @>73;O=CB8 =5>1EV4=VABL V=DC7V9 0=3V>B5=78=C B0/01>
2=CB@VH=L>25==>3> 22545==O :0B5E>;0 ?@5?0@0B 1C2 ?@89=OB89 =5402=>, @5:><5=4CNBLAO
70E>48 7 5;V?0FVT=B8, O:V ?5@51C20NBL =0 35<>4V0;V7V). @8 1@048:0@4VW, I> @578AB5=B=0 4>
B5@0?52B8G=8E 70A>1V2, ?>.070=0 B5@0?VO 70 4>?><>3>N :0@4V>AB8@0. !;V4 ?>ABV9=>
:>=B@>;N20B8 206;82V ?>:07=8:8 68BBT4VO;L=>ABV, :>=F5=B@0FVW 5;5:B@>;VBV2 B0 @V25=L
:@50B8=V=C 2 A8@>20BFV :@>2V.

=40?0
5@H 70 2A5 >7=0:8 3>AB@>W V=B>:A8:0FVW <0NBL D>@4=8E B0 5;5:B@>;VB=8E @>7;04V2
(3V?>=0B@VT:0;VT 4> =8E =0;560BL =C4>B0, 1;N20==O, 0@B5@V0;L=0 3V?>B5=7VO, 70?0
<>@>G5==O (25@B83>), A>=;82VABL, ?>;VC@VO 01> >;V3C@VO 4> 0=C@VW (2=0A;V4>: 3V?>2>;5
<8, A?;CB0=VABL A2V4><>ABV.
V:C20==O. 5>1EV4=> 2825AB8 ?@5?0@0B 7 >@30=V7<8B8 H;C=:>2>:8H:>289 B@0:B, ?@87=0G8B8
0:B82>20=5 2C3V;;O B0 2V4=>28B8 2>4=>-5;5:B@>;VB=89 10;0=A 2 C<>20E AB0FV>=0@C. !8<0B8G=0
B5@0?VO.

>1VG=V @50:FVW.

@8 70AB>AC20==V =78:AC® C> C 1V;LH>ABV 28?04:V2 ?>1VG=V 5D5:B8 1C;8 =57=0G=8<8, <0;8 B8
289 E0@0:B5@ V =5 28<030;8 2V4
=0;0?@8;

I>:C A8AB5<8 :@>2V: 0=5?0BVO, 0CB>V@>18.

I>:C 5=4>:@8==>W A8AB5<8: A8=4@<< ?>@CH5==O A5:@5FVW 0=B84VC@5B8G=>3> 3>@<>=C.
5B01>;VG=V ?>@CH5==O: 3V?>3;V:574V; «A>1;82>ABV 70AB>AC20==O»).

I>:C =5@2>2>W A8AB5<8 V ?A8EV:8: 45?@5AVO, 3>;>2=89 1V;L; A?;CB0=VABL A2V4>>ABV,
A>=;82VABL, 157A>==O, =5@2>7=VABL, ?0@5AB57VW, 25@B83>; @>7;048 A=C, 0=×0;L=V
A=>284V==O.

I>:C >@30=V2 7>@C: 70BC<0=5==O 7>@C.

I>:C A5@F52>-AC48==>W A8AB5<8: 70?0<>@>G5==O; 3V?>B5=7VO (2::NG0NG8 >@B>AB0B8G=C
3V?>B5=7VN), A8=:>?5, 1V;L 70 3@C4=8=>N, ?>@CH5==O @8B0@4VO, B0EV:0@4VO;
>@B>AB0B8G=0 3V?>B5=7VO, ?@8A:>@5=5 A5@F518BBO, V=D0@:B :0@40 01> V=AC;LB, <>6;82>;
2=0A;V4>: =043> 7=865==O B8A:C C ?0FVT=BV2 7 28A>:8< @878:>< (482. @>74V; «A>1;82>ABV
70AB>AC20==O»); D5=><5= 59=>.

I>:C 48E0;L=>W A8AB5<8: :0H5;L; 7048H:0; @8=>@50, 1V;L C 3>@;V B0 70E@8?;VABL, 1@>=E>A?07

I>:C B@02=>3> B@0:BC: =C4>B0; 4V0@50, 014>

I>:C 35?0B>1V;V0@=>W A8AB5<8: ?5GV=:>20 =54>AB0B=VABL, 35?0B8B 35?0B>F5;N;O@=89 G8
E>;5AB0B8G=89, 35?0B8B, 2::NG0NG8 =5:@>7, E>;5AB07 (2::NG0NG8 6>2BO=8FN).

I>:C H:V@8 B0 ?V4H:V@=8E B:0=8=: 28A8?0==O, 3V?5@GCB;82VABL/0=3V>=52@>B8G=89 =01@O:
>1;8GGO, :V=V2>:, 3C1, 078:0, 3>;>A>2>W IV;8=8 B0/01> 3>@B0=V (482. @>74V; «A>1;82>ABV
70AB>AC20==O»); ?V428I5=5 ?>B>284V;5==O, A25@1V6, :@>?82O=:0, 0;>?5FVO;<=>68==0 5@8B5<0,
A8=4@<< !BV25=A0-6>=A>=0, 5:AD>;V0B82=89 45@<0B8B, B>:A8G=89 5?V45@<0;L=89 =5:@>;V7, ?5
45@

>2V4><;O;>AO ?@> @>728B>: A::04=>3> A8<>:> 2AV 7 B0:8E ?@>O2V2, O:: 30@OG:0, A5@>78B,
20A:C;VB, 78B, 0@B@0;3VO/0@B@8B, ?>78B82=89 B5AB =0 0=B8=C::50@=V 0=B8BV;0, ?V428I5==O
H284:>ABV >AV40==O 5@8B@>F8BV2 ((), 5>78=>DV;VO V ;59:>F8B>7. /: ?>1VG=V 5D5:B8<>6CBL
B0:>6 28=8:0B8 28A8?8, D>B>A5=A81V;V70FVO B0 V=HV @50:FVW 7 1>:C H:V@8.

I>:C A5G>284V;L=>W A8AB5<8: ?>@CH5==O DC=:FVW =8@>:, =8@:>20 =54>AB0B=VABL,
?@>B5W=C@VO; >;V3C@VO.

I>:C @5?@>4C:B82=>W A8AB5<8: VB5=FVO; 3V=5:><0ABVO.

030;L=V ?>@CH5==O B0 ?>@CH5==O C<>2 22545==O: 0AB5=VO; ?V428I5=0 2B><;N20=VABL;
<07>2V AC4>8, ?@8?;828, 472V= C 2CE0E, 2V4GCBBO 48A:>@BC, 30@OG:0.

@0B>@=8E ?>:07=8:V2: 3V?5@:0;VT20BFV :@>2V; ?V428I5==O A5G>28=8 C :@>2V, 3V?>=0B@VT =40?0
0728G09 ;V:C20==O ?@5?0@0B< ?5@5=>A8BLAO 4>1@5. V;LHVABL ;V=VG=8E V ;01>@0B>@=8E =51060=8E @50:FV9 T 4>7>70;56=8<8 B0 <>6CBL 1CB8 7=0G=> 7<5=H5=V ?@8 70AB>AC20==V =:>;8 A?>AB5@V30NBLAO 74=>-5;5:B@>;VB=>3> 10;0=AC:
7=865==O @V2=O :0;VN B0 28=8:=5==O 3V?>:0;VTA>1;82> C ?0FVT=BV2 7 3@C? @878:C);
3V?>=0B@VT <>65 ?@8725AB8 4> 3V?>2>;5@30=V7
71V;LH5==O @V2=O A5G>2>W :8A;>B8 B0 3;N:>78 C ?;072V ?V4 G0A ;V:C20==O 4VC@5B8:0<8,
@0FV>=0;L=VABL ?@87=0G5==O O:8E<0T 1CB8 @5B5;L=> 72065=0 ?5@54 ?@87=0G5==O<
?0FVT=B0< V7 ?>403@>N 01> FC:@>28< 4V015B<<;
3V?5@:0;LFVT
;V=VG=V ?@>O28.
I>:C H;C=:>2>-.8H:>2>3> B@0:BC: =C4>B0, 1;N20==O, 70?>@, ACEVABL C @>BV; ?0=:@50B8B;
?>@CH5==O DC=:FVW ?5GV=:8; ?V428I5==O @V2=O ?5GV=:>28E D5@<5=BV2. # ?0FVT=BV2 V7
?5GV=:>2>N =54>AB0B=VABN ?5GV=:>20 5=F5D0;>?0BVO.
I>:C F5=B@0;L=>W =5@2>2>W A8AB5<8: 70?0<>@>G5==O, 0AB5=VO, ?0@5AB57VO, 3>;>2=89
1V;L, 157A>==O, ?V428I5=0 2B<;N20=VABL, B@82>6=VABL, 45?@5AVO; =5?@8B<=VABL.
I>:C >@30=V2 7>@C: ?>@CH5==O 7>@C: ;>= N=:B82VB.
I>:C A5@F52>-AC48==>W A8AB5<8: 0@8BB5=7VO; ?0@>:A87<0;L=0 H;C=>G:>20 B0EV:0@4VO B8?C
«?V@C5B» (torsades de pointes), I> <>65 ?@8725AB8 4> ;5B0;L=>3> =0A;V4:C; ?>4>265==O V=B5@20;C
QT =0 5;5:B@>:0@4V>3@0
5A?V@0B>@=V 70E2>@N20==O, B>@0:0;L=V B0 <54V0AB8=0;L=V @>7;048: :0H5;L, D0@8=3VB,
A8=CA8B, @8=>@5O, @8=VB.
I>:C =8@>: B0 A5G>282V4=>W A8AB5<8: =8@:>20 =54>AB0B=VABL, 7@>AB0==O G0AB>B8
@>728B:C V=D5:FV9, =V:BC@VO, ?>;VC@VO, ?V428I5==O 07>BC A5G>28=8, :@50B8=V=C.
I>:C @5?@>4C:B82=>W A8AB5<8: 7=865==O ;V1V4>, 7=865==O ?>B5=FVW.
I>:C >128=: 3;N:>7C@VO, ?VB;82VABL, 7<5=H5==O <0A8 BV;0.
;5@3VG=V @50:FVW: @50:FVW 3V?5@GCB;82>ABV, 3>;>2=8< G8=>< 7 1>:C H:V@8, C ?0FVT=BV2,
O:V <0NBL AE8;L=VABL 4> 0;5@3VG=8E B0 0AB<0B8G=8E @50:FV9, 2;;NG0NG8 B0:V ?@>O28:
<0:C;>?0?C;L>7=V 28A8?0==O, ?C@?C@0, 703>AB@5==O A8AB5<=>3> G5@2>=>3> 2>2G0:0,
0=3V>=52@>B8G=89 =01@O: B0/01> :@>?82O=:0, B>:A8G=89 5?V45@<0;L=89 =5:@>;V7, A8=4@<
!BV25=A0-6>=A>=0, D>B>GCB;82VABL, 35<>@03VG=89 20A:C;VB.
5<0B>;>3VG=V ?>@CH5==O: B@><1>F8B>?5=VO, ;59:>?5=VO, 03@0=C;>F8B>7, 35<>;VB8G=0 0=5
030;L=V 70E2>@N20==O B0 A8BC0B82=V C<>28 ?@87=0G5==O ?@5?0@0BV2: 3@8?>?>4V1=89
A8=4@<, 1V;L C 3@C4=V9 ;;VBFV; A?8=V, V=D5:FVW, 703>AB@5==O A8AB5=>3> G5@2>=>3>
2>2G0:0.

"5@ABV.3 @>:8.

#<>28 715@V30==O. 15@V30B8 ?@8 B525 °C 2 >@83V=0;L=V9 C?0:>2FV 4;O 70E8ABC 2V4 A2VB;0 B0
2>;>3>ABV. 15@V30B8 C =54>ABC?=>

#?0:>2:0. <<1V-C?0:>2:0: 10 B01;5B>: (1V;LH>3> @>710 <3 B0 5 B01;5B>:, 2:@8B8E ?;V2:>2>N
>1>;>=:>N, (<5=H>3> @>7 2,5 <3 C 1;VAB5@V; ?> 3 1;VAB5@8 C :0@B>==V9 :>@>1FV.

0B53>@VO 2V4?CA:C. 0 @5F5?B>

8@>1=8:. <%5<>D0@

VAF57=0E>465==O 28@>1=8:0 B0 9>3> 04@5A020465==O 4VO;L=>ABV.
5;3@04AL:89 H;OE 1/=, 26300, <. @H0F, !5@1VO.