

EDST5436

9j U'i Uhjcb'cZ9Xi WWhjcbU`Dfc[fUa g

HYfa &Z&\$&&



7 ci fgY`Cj Yfj]Yk

GHJZZ'7 cbHJW`8YHJ]`g

7cbj Ybcfg

BUa Y	9a U]`	5j U]`UV]`]fm	@cW]h]cb	D\cbY
A U]U]; i bb K Uh_]bgcb	a "[i bbk Uh_]bgcb4 i bgk "YXi " Ui	Vm WŁffYgdcbXYbW		

GW\cc``7 cbHJW`bZcfa Uh]cb

GW\cc``cZ9Xi W]h]cb

5ftgž8Yg][b`UbX'5fW\]hYW`i fY

; fci bX: `ccfžA cfj Yb'6fck b'6i]X]b[`fi &\$Ł

H. Ž *%f&Ł-' ,) `%- ++

9. YXi W]h]cb4 i bgk "YXi "Ui

K . \hđg.## k k "Uftg"i bgk "YXi "Ui #YXi W]h]cb

5W_bck`YX[Ya YbhcZ7ci blfm

I B GK `5fngž8Yg][b`UbX`5fWk]fYWhi fY? Ybg]b[hcb`UbX`DUXX]b[hcb`Wla di gYg`UfY`Vi]hcb`5Vcf][]bU`
@UbXg"K Y`dUmci f`fYgdYWhg`hc`hY`6]X}[U`UbX` ; UX][U`dYcd`Yg`k`c`UfY`hY`7i`gfcX]Ubg`cZ`hY`gY`UbXg"
K Y`UW_bck`YX[Y`hY`5Vcf][]bU`UbX`Hc`fYg`G`fU]h`g`UbXYf`dYcd`Ygž`hY` :]fgh5i`gfcU`Ubgžk`c`gY`UbXgž
k]bXg`UbX`k`U`fYg`k`Y`U`bck`g`UfYž`UbX`dUm`fYgdYWhi`hc`hY`f`i`b]ei`Y`j`U`i`Ygž`UbX`hY`f`V`b`h]bi]b[`UbX
YbXi`f]b[`W`h`fYg`k`\\W`XYYdYb`UbX`Yb`f]W`hY`Z`cZci`f`b`U`h`cb`UbX`W`a`a`i`b]h`Yg`"

U[Y`W`ci`f`h`g`m`c`Z`h`Y`C`Z]W`c`Z`h`Y`D`f`c`J`]W`!`7`\\UbW`c`f`b`X][Ybci`g`[L`B`G`K`f`g`b`X\]\[Ybci`g`g`f`U`h`\[`m](#)

7ci fgY'8YHJ`g

I b]hg'cZ7fYX]h*`

K cf_`cUX

%) \$` \ci fg]bWi X]b[`WUgg`WcbUW\ci fgžfYUX]b[gžWUgg`dfYdUfU]cbžUggYgga YbhžZc`ck`i d`UW]j]hYgž YHW

Gi a a UfmcZ`h`Y`7ci fgY

h`h]g`Wci fgYžmci `k]`YUfb`hc`Yj`U`i`UH`YXi`W]h]cbU`dfc[fUa`gžVYWca`]b[`]bZcfa`YX`Wcbgi`a`Yfg`cZUbX`Wcbf]Vi`hc`f`hc`k` \Uhk`cf_g`]b`YXi`W]h]cb`"H\Y`Wci`fgY`k`]`ZcW`g`cb`Yj`U`i`U]h]cb`h`Yc`fmi`UbX`dfUW]W`" `h`XfUk`g`Zca`h`Y`Z`" `fU]b[Y`cZ`]h`fU]h`fY`cb`Yj`U`i`U]h]cbžVi`hZcW`gYg`cb`h`Y`"]h`fU]h`fY`UbX`W]gYg`]b`YXi`W]h]cbU`Yj`U`i`U]h]cb`WcbhY`hg`"

7ci fgY`@YUfb]b[`Ci`hWca`Yg

" 8]gW`gg`h`Y`Udd`]W]h]cb`cZdfc[fUa`Yj`U`i`U]h]cb`]b`YXi`W]h]cb`h`fci`[`]bX]j`]Xi`U`UbX`Wc`"UVcfU]h]`Y`]bei`]fmcZ`h`Yc`fmi`UbX`fYgYUfW`VUgYX`UddfcUW`Yg`hc`dfc[fUa`Yj`U`i`U]h]cb`"
&" 7f]h]W`"mUddfU]gY`X]ZYZfYb]h`h`Yc`fYh]W`"UbX`fYgYUfW`!VUgYX`UddfcUW`Yg`hc`Yj`U`i`U]h]cbž`UbX`XYhYfa`]bY`fY`Yj`UbW`Zc`f`Yj`U`i`U]h]cb`cZdfc[fUa`g`]b`YXi`W]h]cb`"
' " 9i`d`U]b`h`Yc`fYh]W`"UbX`fYgYUfW`VUgYX`dfcW`Xi`fYg`h`U`h`Wci`X`VY`i`gYX`]b`h`Y`Yi`YW`h]cb`cZU`dfc[fUa`Yj`U`i`U]h]cb`]b`U`dfYj`]ci`g`c`f`W`ffYb]h]dfcZ]gg]cbU`k`cf_`WcbhY`h`"
(" 5dd`mUddfcdf]U]h`h`Yc`fYh]W`"UbX`fYgYUfW`VUgYX`Yj`U`i`U]h]cb`gh`fU]h`[]Yg`]b`U`d`Ub`hc`Yj`U`i`UH`Ub`YXi`W]h]cbU`dfc[fUa`]b`U`dfYj`]ci`g`c`f`W`ffYb]h]dfcZ]gg]cbU`k`cf_`WcbhY`h`"
) " 7f]h]W`"mX]gW`gg`h`Y`h`Yc`fYh]W`"UbX`dfUW]W`"jgg`Yg`]b]`c`j`YX`]b`h`Y`Yj`U`i`U]h]cb`cZdfc[fUa`g`]b`YXi`W]h]cb`"

5i ghfU`]Ub`DfcZ]gg]cbU`GH]bXUfXg`Zc`f`HYUW`Yfg

GH]bXUfX		5ggYgga`Ybh]g
&"&"&	8Yg][`b`UbX`]a`d`Ya`Ybh`YUfb]b[`UbX`hYUW]b[`dfc[fUa`g`i`g]b[`_bck`YX[Y`cZW`ff]W`i`a`žUggYgga`YbhUbX`fYdcf]b[`fYei`]fYa`Ybhg`"	%ž&
&"`"	Gi`ddcfh]Wc`"YU[i`Yg`hc`d`Ub`UbX`]a`d`Ya`Ybh`YUfb]b[`UbX`hYUW]b[`dfc[fUa`g`i`g]b[`WcbhYa`dcfUfm`_bck`YX[Y`UbX`i`bXYfgh]UbX]b[`cZ`W`ff]W`i`a`žUggYgga`YbhUbX`fYdcf]b[`fYei`]fYa`Ybhg`"	%ž&
&"`"(`	@YUX`Wc`"YU[i`Yg`hc`XY`Y`cd`"YUfb]b[`UbX`hYUW]b[`dfc[fUa`g`i`g]b[`Wca`dfY`Ybg]`Y`_bck`YX[Y`cZW`ff]W`i`a`žUggYgga`YbhUbX`fYdcf]b[`fYei`]fYa`Ybhg`"	%ž&
'`""&	9j`U`i`UH`dYfgcbU`hYUW]b[`UbX`YUfb]b[`dfc[fUa`g`i`g]b[`Yj`]XYbW`ž`]bWi`X]b[`ZYXVUW`_Zca`gh`XYbh]UbX`gh`XYbh`UggYgga`YbhXU]h]ž`hc`]bZcfa`d`Ubb]b[`]"`	%ž&
'`""`"	K`cf_`k`]h`Wc`"YU[i`Yg`hc`fYj`]Yk`W`ffYb]h]hYUW]b[`UbX`YUfb]b[`dfc[fUa`g`i`g]b[`gh`XYbhZYXVUW`ž`gh`XYbhUggYgga`YbhXU]h]ž`_bck`YX[Y`cZW`ff]W`i`a`UbX`k`cf_`d`UW`dfUW]W`g`"	%ž&
'`""`"(`	7cbXi`W]h]fY[i`Uf`fYj`]Yk`g`cZ`hYUW]b[`UbX`YUfb]b[`dfc[fUa`g`i`g]b[`a`i`h]d`Y`gci`fW`g`cZ`Yj`]XYbW`]bWi`X]b[`gh`XYbh`UggYgga`YbhXU]h]ž`W`ff]W`i`a`XcW`a`Ybhž`hYUW]b[`dfUW]W`g`UbX`ZYXVUW`_Zca`dUfYbhg`#W]fYfgž`gh`XYbh]UbX`Wc`"YU[i`Yg`"	%ž&

)"("&	I gY'ghi XYbhUggYgga YbhXUHU'hc'UbU'mgY'UbX'Yj U'i UHY'ghi XYbh i bXYfghUbX]b['cZgi V'YVW#W'cbhYbhz]XYbhZm]b[']bhYfj Ybh]cbg'UbX a cX]Zm]b['HYUWX]b['dfUW]W"	&
)"("	K cf_k]h'Wc''YU[i Yg'hc' i gY'XUHU'Zca']bhYfbU''UbX'YI H'fbU' ghi XYbhUggYgga Ybhg'Zcf'Yj U'i U]b['YUfb]b['UbX'HYUWX]b[ž]XYbhZm]b[']bhYfj Ybh]cbgž'UbX'a cX]Zm]b['HYUWX]b['dfUW]W"	&
)"("("	7 c!cfX]bUHY'ghi XYbhdYfZcfa UbW'UbX'dfc[fUa'Yj U'i U]cb'i g]b[]bhYfbU''UbX'YI H'fbU''ghi XYbhUggYgga YbhXUHU'hc'ja dfcj Y HYUWX]b['dfUW]W"	&
)")"&	F YdcfhWYUf'mž UWW' fUHY'mž UbX'fYgdYWZi ''mhc'ghi XYbhg'UbX dUfYbhg#WUfYfg'UVci hghi XYbhUWX]Yj Ya Ybhz'a U_]b['i gY'cZ UWW' fUHY'UbX'fY'UV'Y'fYW'fXg"	&
)")"	K cf_k]h'Wc''YU[i Yg'hc' Wc'bgfi W'UWW' fUHY'ž]bZcfa U]j Yž'UbX h]a Y'mfYdcf]g'hc'ghi XYbhg'UbX'dUfYbhg#WUfYfg'UVci hghi XYbh 'YUfb]b['UbX'UWX]Yj Ya Ybh'	&
)")"("("	9j U'i UHY'UbX'fYj]gY'fYdcf]b['UbX'UW'ci bhUV']]mia YW'Ub]ga g]b hY'gW'cc''hc'a YYh'hY'bYXg'cZgh XYbhgž'dUfYbhg#WUfYfgž'UbX Wc''YU[i Yg"	&

HYUWX]b['GhfUHY[]Yg'

F U]cbU'Y.

H\]g'W'ci fgY'jg]bW' XYX'hc'YbUV'Y'ghi XYbhg'hc'XYj Y'cd'Ub' i bXYfghUbX]b['cZYj U'i U]cb'hU'hk]''Yb\UbW' hY]f'dfUW]W' Ug''YUXYfg'cZYXi WU]cb'cf[Ub]gU]cbg''#fYZYW'g'U'j]Yk 'hU'Ub' i bXYfghUbX]b['cZYj U'i U]cb hYcfmcZYfg'U'Wc''YfYbhgYhcZW'cbW'dh U'ž'ld'chYh]W'ž'dfU[a U]WU'UbX'Yh]W' 'df]bW]d'Yg'hc' [i]XY'hY' ghi Xm'UbX'dfUW]W' 'cZYj U'i U]cb

HYUWX]b['GhfUHY[]Yg.

H\Y'W'ci fgY'k]''XYj Y'cd'UbX'gh]a i 'UHY'ghi XYbhW]h]W' h]b_]b['i g]b['U'V'YbX'cZhfUX]h]cbU'ZUW'!hc!ZUW' 'YV'h' fYg'UbX'dfUW]W' 'gYa]bUf'UW]j]hYg''H\YgY'k]''\Y'd'ghi XYbhg' i bXYfghUbX'UbX'XYj Y'cd'hY]f'ck b j]Yk g'cb'hY'Uddfcd]UHY' i gY'cZ'hYcf]Yg'UbX'Udd']WU]cb'cZYXi WU]cbU'Yj U'i U]cb''

; fci d'X]gW'gg]cbž'dfcV'Ya !VUgYX'UW]j]hYg'UbX'WUgY'ghi X]Yg'UfY'XYg][bYX'hc'U'ck 'hY'Udd']WU]cb'cZ Yj U'i U]cb'ghfUHY[]Yg'hc'U]X']b'hY'fYU']gU]cb'cZUb'Yj U'i U]cb'd'Ub'Zcf'ghi XYbhg'W'c]W' 'cZYXi WU]cbU' dfc[fUa "

5ggYgga Ybh

5ggYgga YbhUg_	K Y[\ h	8i Y'8UHf	7ci fgY'@YUfb]b[Ci hWca Yg'5ggYggYX
%'5bbchUHfX'6]V`c[fUd\m	(\$i	&+#\$* #&\$&&\$) .\$\$'DA	' ž)
&"9j U'i Uhcb'D`Ub	* \$i	%(#\$, #&\$&&\$) .\$\$'DA	' ž'(ž)

5ggYgga Ybh%'5bbchUHfX'6]V`c[fUd\m

8i Y'XUHf. '&+#\$* #&\$&&\$) .\$\$'DA

5ggYgga Ybh%'5bbchUHfX'6]V`c[fUd\m

GY'YWh) 'dfc[fUa 'Yj U'i Uhcbg'hUhmci 'Wcbg]XYf'hc 'VY`[\ \ 'ei U]mUbx'dfcj]XY'UbbchUhcbg'Zcf'YUW'cZ
 hYa "'H\Y'Yj U'i Uhcbg'bYfX'bchg\ck 'dcg]hj Y'fYgi 'hgž'Vi hmc'ig\ci 'X'VY'UV'Y'hc 'XYZ'bX'h\Y'Yj U'i Uhcbg
 Ug'a YhcXc'c[]WJ`mUbx'WcbWdh U`mfcVi gh'H\YgY'Wb'VY'XfUk b'Zca 'dYf'fYj]Yk YX'di V]WUhcbgž
 [cj Yfba Ybh'fYdcf'gž'Zci bXUhcb'fYdcf'gž'cf'ch\Yf'gci fWg": cf'YUW'Yj U'i Uhcb'fYdcf'gž'Zci 'g\ci 'X'k f]h'.

% Di fdcgY'cZhY'Yj U'i Uhcb/
 &" G\cfhXYgW]dhcb'cZhY'Yj U'i UbX/
 ' " Gi a a UfmcZhY'a YhcXc'c[mi gYX/UbX
 ("

a Yhcx#gl/
, " 9h]Wj`Wc]bg]XYfU]c]bg/
- " 8Uhu`UbU`mg]g/
%\$" D`Ub`Zc`f`X]ggYa]bU]cb/UbX
%%" H]a Y`]bY

K cfX`@]a]h!`(`z) \$\$`k cfXg

5XX]h]cbU`XYHU]`g

H\cgY`k`l`c`\Uj Y`bc`Yl dcgi fY`tc`gW]cc`mYh`Wc]bg]XYf`h`Y`\mdch`Yh]Wj`9Xi W]h]cbU`Dfc[fUa`dcgh`X`]b
A ccX`Y``6i]X`mci f`Yj U`i U]h]cb`d`Ub`Zca`h`UhgW]bUf]c"

8YHU]`YX`]bZcfa U]h]cb`cb`YUW]`cZ]h`YgY`UggYgga Ybhg`W]b`VY`Zci bX`cb`h`Y`98GH) (`*`A`ccX`Y`g]h"

GdYWZ]W7 f]hYf]U

11fł—————2fł

Ghfi Wfi fY'UbX'cf[Ub]gUh]cb'cZfYgdcbgY

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FI 6F 7 # 998657? 'G<99H
98GH) (' * '9J 5@ 5H€B 'C: '98I 75H€B5@'DF C; F 5A G
I BGK 'G7<CC@'C: '98I 75H€B

5ggYgga YbhHUg_ '& '9j U'i U]cb'D`Ub

GdYWZ]W7 f]hYf]U	1fŁ ————— 2fŁŁ				
I bXYfghUbX]b['cZhY'ei Ygh]cb'cf']ggi Y'UbX'h\Y'_YmWŁbWdŁg]bj c'j YX					

F Ygci fWg

DfYgWf]VYX F Ygci fWg

F Yei]fYX F YUX]b[g

Gi Va]gg]cb'cZ5ggYgga YbhiHUg_g

Hi fb]h]b'Gi Va]gg]cb

≠Zmci 'YbWci bHYf'U'dfcV'Ya 'k \Yb'UH'Ya dh]b['hc'gi Va]hmc i f'Ugg][ba YbhiH'fci [\ 'Hi fb]h]bž'd'YUgY
HY'Yd\cbY'9I HYfbU'Gi ddcfh'cb'-' ,) " ' ' %cf'Ya U] 'H'Ya 'cb'YI HYfbU'HY'hgi ddcfh4 i bgk "YXi "Ui "'Gi ddcfh
\ci fg'UfY' , .\$Ua '—%\$. \$\$da 'cb'k YY_XUmg'UbX'-. .\$Ua '—) . \$\$da 'cb'k YY_YbXg'f1 *) 'XUmg'U'm'UfL" ≠Zmci
UfY'i bUV'Y'hc'gi Va]hmc i f'Ugg][ba YbhiXi Y'hc'U'Zi 'hk]H'Hi fb]h]b'mci 'a UmiUdd'm'Z'f'Ub'YI HYbg]cbž'Vi hmc i

5 WUXYa]W< cbYgmiUbX`D`U[]Uf]ga

D`U[]Uf]ga `]g`i g]b[`h`Y`k cfXg`cf`]XYUg`cZc`h`Yfg`UbX`dFYgYbh]b[`h`Ya `Ug`mci f`ck b``#WU`b`hU`_Y`a`Ubm`
Zcfa gZ`Zca `XY`]VYfU`h`V`X`Y`U`h]b[`h`c`U`W`Y`X`Y`b`h`U`m`W`c`d`m]b[`Z`ca `U`gci f`W`k`]h`ci`h`U`W`_`b`ck`Y`X[`Ya`Y`b`h`

I BGK `[fci dg`d`U[]Uf]ga `]b`h`c`h`Y`Z`c``ck`]b[`W`U`h`Y[`cf]Yg.

7 cd`m]b[.`I`g]b[`h`Y`g`Ua`Y`cf`j`Y`f`m`g]a`]U`f`k`cf`X`g`h`c`h`Y`c`f][`]b`U`h`Y`h`c`f`]X`Y`U`k`]h`ci`h`U`W`_`b`ck`Y`X[`]b[`h`Y`
gci f`W`c`f`i`g]b[`ei`c`h`U`h`c`b`a`U`f`_`g``H`g]b`W`i`X`Y`g`W`c`d`m]b[`a`U`h`f]U`g`z`]X`Y`U`g`c`f`W`c`b`W`d`h`g`Z`ca`U`V`cc`_`z`U`f`h]W`Y`z`

5 WUXYa]W=Zcfa Uh]cb

8i Y`tc`Yj`c`j`]b[`UXj`]W`VmB`GK` `<YU`h`z`gh`XYbh`a`i`gh`WXYW`Zc`f`i`dXUH`X`]bZc`fa`Uh]cb`fY[`UfX]b[`cb`]bY`YUfb]b[`Zc`f`U`5`f`g`z`8`Yg][`b`UbX`5`f`W`]H`W`i`f`Y`W`i`f`g`Y`g`h`]g`H`f`a``f`j`]U`A`cc`X`Y`c`f`W`i`f`g`Y`]bZc`fa`Uh]cb`dfcj`]XYX`L

: cf`YggYbh]U`gh`XYbh]bZc`fa`Uh]cb`fY`Uh]b[`tc.

- fYei`Yg`tg`Zc`f`YI`H`bg]cb/
- `UH`gi`Va`]gg]cbg`[`i`]XY`]bYg/
- fYj`]Yk`cZa`Uf_g/
- I`B`G`K` `<YU`h`UbX`GUZ`h`m`d`c`]W`Y`g/
- YI`Ua`]bUh]cb`dfc`W`X`i`f`Y`g/
-